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Livable Cities - London A Critique of Issues Affecting Life in Cities

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INTRODUCTION

Livable Cities - London

A Critique of Issues Affecting Life in Cities

Today, the societies, cultures, and the places in which we live and work are increasingly intricate phenomena. Globalization eradicates spatial boundaries to business. Gentrification involves social and political pressure. Pandemics are never site specific or confined to the past. Architecture and urban design are global endeavors. Sustainability requires material and political action. Patterns of criminality are not place bound. Similarly, the need for education and housing are universal and land rights are essential legal tools for First Nations and communities everywhere.

Within this mode of thinking, when we discuss sustainability we must consider local planning and global politics. When we speak about smart cities, we are obliged to consider cyber security and civil rights. When we discuss law and human rights, we cannot ignore economic or social policy. Equally, when we think about food production and consumption, we must consider transportation costs, public health, and more.

In reading livability as an aggregate of forces then, Volume One of the Livable Cities – London proceedings, do not see ‘the city’ as primarily a physical and designed entity. On the contrary, it posits ‘the livable city’ as a ‘construct’ involving a plethora of agendas, practices and disciplines. As an inherently interdisciplinary publication it explores cities as both a series of material questions and immaterial phenomena. It critiques the city as an interplay of forces that includes spatial design, but importantly focuses of politics, sociological trends, cultural tendencies and media representations, as much as it involves economic policy, planning strategy and the provision of public services.

By juxtaposing, comparing and sharing work in various fields then, it is expected that a broader and richer picture will emerge in these pages with respect to what makes the places we inhabit more, or less, livable.

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EXPLORING LIVABILITY IN SOCIAL HOUSING TRANSFORMATION PROCESSES: A COMPARATIVE STUDY OF TWO CASES IN DENMARK AND LATVIA

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INTRODUCTION

Transforming physical environments like social housing areas invites multiple thoughts and discussions on what and how makes these livable for its numerous, plural residents. In this study, we refer to livability as the quality of life in the built environment, viewed from a pluriversal perspective and not as a score given to rank the greatness of urban areas. Thus, recognizing the multiple entanglements of humans and nonhumans that come to the fore through co-creations between the “designed” and natural environments. Addressing the challenges of creating fair, inclusive, and equitable living spaces in our built environment is crucial.¹ The topic raises the question of how existing processes for transforming spaces can be opened to new and diverse perspectives and how design processes can anchor discussions about immaterial aspects of life in social housing transformations. This is the basis for the following study, where we explore the potential of participatory design processes in social housing transformation and the potential arising for opening such processes to more-than-human perspectives through the following research question: *What are the potentials of using design methods to explore multifaceted perspectives of livability in social housing transformation projects?* We discuss potential and barriers in designing green spaces with nonhuman concerns, e.g. nurturing participatory culture, establishing vocabulary, framing methods, and tools to involve more-than-human perspectives.

THEORY

The question of livability can be traced to Appleyard, who noted the precarity of urban environments as living places for humans and other species.² Creating livable communities is a key urban concern,³ but what makes an urban environment livable and for whom? Livability is sometimes defined as “The quality of the match between people and their living environment”⁴ and communicated through indexes ranking cities on aspects like mobility, health, income, safety, and amenities.⁵ Models are built on methodologies and theories for measuring livability in developed and developing economies by accrediting parameters important to inhabitants' well-being.⁶

Livability in the Context of Social Housing Transformations

To address the diverse livability challenges in social housing areas, Heylen proposes distinctions between the quality of social environments, built environments, resident characteristics, and external factors.⁷ Similarly, Ahmed et al. note that livability is typically perceived as a subjective concept concerning a behavior-related function of interactions between the environment and its inhabitants.⁸ Bearing resemblances to bottom-up approaches, efforts toward creating livable communities focus on determinants that recognize systemic and ecological understandings of the health and well-being of neighborhoods.

Despite its ambiguity and context-dependent orientation, livability can be a philosophy to guide context-specific developments.⁹ Urban spaces have often been exceptional to humans.¹⁰ However, we explore how we might ensure and bring in a more-than-human perspective, emphasizing human-nonhuman entanglements as crucial to include in discussions of livability and the implications for designing with communities.

Design methods to embrace multiple perspectives in urban transformations

The fields of participatory design provide avenues for broadening the scope of intervention beyond the human position. Positioning existing social housing as welfare landscapes, Jessen & Tietjen reframe design practices and policies to look to the future by considering how non-human things are already embedded in the development of the built environment, for example, through topographical premises.¹¹ Clarke et al. suggest decentering human agencies to explore more-than-human timescales and include knowledge layers that are not exclusively human-centred.¹² And researchers like Akama et al. inquire, “what could be articulated as ‘participatory’?”,¹³ proposing strategies of “always-participating-with-many”¹⁴ wherein designers and stakeholders are encouraged to look beyond the human perspective.¹⁵ Participatory processes can be rooted in specific landscape design interventions. This takes form through the realization of, e.g., community garden programs because their capacity to involve and empower is contingent on the interests and needs of many, often very different, stakeholders.¹⁶ Design processes also present opportunities for people to actively participate in designing places together, for example, through co-design. Inviting different people, professions, and authorities to think about a place's future is one key point for genuine co-creation.¹⁷ To leverage landscape design to support participatory processes, Raaphorst et al. suggest that design representations can bolster co-design processes as a visual discourse that transforms expectations, synthesizes stakeholder perspectives, and creates new knowledge by pulling on local insights.¹⁸

Building on these streams of literature, we see a few relevant directions to consider when designing with more-than-human perspectives: it implies entering new terrain, vocabulary, and practices, which might challenge our imagination – one aspect should thus emphasize building the capacity to speculate and imagine beyond status quo¹⁹ and generate desirable alternative directions.²⁰ We notice that such imaginations might be better grasped when made tangible; for example, Raaphorst et al. foreground transformational potential in using design representations that, for example, can be used to visualize future cities.²¹ Lastly, we surmise that such processes must have attention to design processes where new and diverse perspectives are welcomed to deliberately include other species.²²

Summary and research gap

A view rooted in a pluriversal perspective sees the human communities that must thrive during and after the social housing transformation and the spaces they inhabit while seeking to bring entanglements to other life forms in that process. Making such processes inclusive and just for humans and nonhumans requires design schemes and approaches (incl. methods, workshops, renderings, and built fabric) that

make us aware of relations differently. The New European Bauhaus movement is an initiative that calls on Europeans to imagine and build a sustainable, inclusive, and beautiful future to enable the green transition of society, transforming various sectors, especially the built environment.²³ With our paper, we explore how, building on New European Bauhaus ambitions, design processes might be leveraged to open social housing transformation processes to voices not typically included and discuss what this means against the aspiration of wanting to explore and envision a future where nonhuman perspectives are included as well.

RESEARCH METHOD

The paper presents two social housing cases from the EU-funded New European Bauhaus lighthouse project ‘Desire’: Designing the Irresistible Circular Society.²⁴ Desire experiments with creating sustainable, attractive, and inclusive living spaces within the green transition of the built environment where art, design, and architecture play a key role. Within the project framework, both sites worked with principles as a frame and drivers for transformation (circularity, belonging, biodiversity, movement, and aesthetics) in contrasting places. The empirical foundation of this paper stems from the author’s access to and involvement in the project. A deep understanding of the two sites and their respective transformations has been obtained through in-person and online workshops, material shared by the sites, interviews, informal conversations, field excursions, and participatory observation of locally run workshops (see overview in Table 1).

Case descriptions

Gadehavegaard is a large social housing area on the outskirts of Copenhagen that will significantly transform, impacting existing and future residents; for example, public housing will be reduced to 40%, and a large road and parking areas will be transformed into a new green park.²⁵ Through the Desire project, the team has kickstarted a co-creation process to explore the future park area, focusing on biodiversity and circularity. Such ambitions have manifested in collaboration with a school and two 8th-grade classes to co-design visions and principles for the future green park.²⁶

Ziepjū 11 is an abandoned five-story Soviet housing block from the 1970s in Riga, Latvia. Ownership lies with the municipality, which will redesign the building for social housing.²⁷ Through Desire, the municipality focuses on involving existing and future residents in the design processes of transforming a courtyard. Through co-creation workshops, participants representing families and older people were invited to share their perspectives on a future courtyard with the municipality.²⁸ Initiating and experimenting with participatory processes is new to the inhabitants and municipality and could potentially inform future design decisions.²⁹

FINDINGS

In the following, we analyze the potential of design processes in the two site transformations and how they connect to include more-than-human perspectives. We have divided these into three themes that concern the framing of activities, co-designing renderings and visualizations, and creating space and moments for trust-building across diverse groups.

Activities	Date	Stakeholders	Methods	Tools of rendering
Theme weeks: Design process focusing on future park	September 2023, Copenhagen	Pupils Teachers Expert organizations and facilitators (GXN, AGORA) Housing Administration Company (Domea)	Interviewing Field excursions Photography Brainstorm Peer learning	Sketching Model building Writing Presentation Digital visualizations
Workshop: A desirable green courtyard to support social and inclusive housing	August 2023, Riga	Residents Future residents Riga Municipality	Brainstorm Visual prompts Peer learning	Annotated maps Pictures

Table 1. Overview of locally run workshops

Framing activities to embrace multiple perspectives

Within both sites, activities, and scope focus on an outdoor area. The first aspect of our findings points to how activities were designed to frame the design challenge in a way that made it clear why participants were invited while also framing in a way that clarified the scope. For Gadehavegaard, participants were asked to design and envision a future green park in balance and focusing on the circularity of material. For Ziepju, Riga, participants suggested ideas for a future courtyard, focusing on recreational activities, benches, and functions, such as sheds for garbage cans.

In Gadehavegaard, the activities were offset by a design sprint approach introduced by two project collaborators: an architectural company and a consultancy studio specializing in community development and humanistic data analysis.³⁰ Pupils underwent a two-week design process grounded in nurturing their agency to communicate design proposals. Various tools and approaches introduced biodiversity and circularity of materials. Powered by the creative core of design thinking, pupils learned how to harness different methods and tools to express their wishes and other perspectives.



*Figure 1. Gadehavegaard
September 2023. Photo
credit: Benjamin Hesselholdt*



*Figure 2. Picture of map created
during workshop in Ziepju. Photo
credit: Rudis Rubenius*

In Ziepju, the municipality facilitated the workshop to create dialogue across the thresholds of inhabitants and municipality, showing how the unison of residents can create desirable places and

communities. This included walks in the area and sessions where residents were invited to share and listen deeply. The engagement time was shorter, and participants, both existing and future inhabitants, were invited to explore potentials in the surrounding green spaces and work together in groups to discuss and envision its future transformation using maps and prompts. The workshop provided stakeholders with a setting to explore, brainstorm, and build relations, anchored in an activity where the imagination was supported by accessible design material to reach the wide demography (table 1).



Figure 3. Workshop at Ziepjū. Photo credit: Rudis Rubenis



Figure 4. Workshop at Ziepjū. Photo credit: Rudis Rubenis

Co-designing renderings and visualizations of future designs

Tools and techniques enabled participants to express, articulate, and discuss tangible manifestations of what the areas could become. In the case of Gadehavegaard, tangible outcomes of the design process found their expression in physical models, sketches and writings created by the students and software-generated renderings on posters by architectural experts who facilitated the process. The design solutions provided a physical structure for the imagined future park. The outcome was ideas that communicated their needs and wishes while emphasizing balance in human-nature relations and concerns of material origins. Upon presenting their ideas to a broader audience, the renderings enabled outsiders to engage with questions about the future park area in an immersive, creative way. They considered multiple perspectives: youngsters, pupils, material, rainwater, residents, parents, and children, to name a few. A more-than-human aspect can indirectly be traced in the framing, focusing on biodiversity and circularity of materials. For example, during a presentation, one group presented a river, bridge, and thriving flowerbeds, which made one from the audience express how this could be a solution for gathering excessive rainwater.



Figure 5. Sketch from workshop in Gadehavegaard, 2023. Photo credit: Hanne Kokkegaard, DTU.



Figure 6. Sketch from workshop in Gadehavegaard, 2023. Photo credit: Hanne Kokkegaard, DTU

Moreover, a more-than-human perspective could be traced in some solutions that deliberately sought to merge with trees and grass and not look artificial.

In Ziepju, the workshop focusing on the courtyard redesign similarly departed from human needs and wishes for the area, which were manifested on maps, with annotations and pictures to show where and how design opportunities may present themselves in the exterior spaces of the housing area. Tasked with envisioning an attractive green space between the building blocks, participants were presented with a way of communicating their thoughts and ideas by rendering the spaces using pre-made maps, photographs, and icons depicting, e.g., urban furniture for play and leisure. One “unarticulated” but interesting aspect of the workshop was the unvoiced perspective of trees. A profound respect (if that is what it is) for existing plant life was noticed – trees are not torn up for the sake of buildings. This was also a premise for the design exercise, as the trees were an integral part of the map, not to be altered.

Creating space and moments for trust-building across diverse groups

Although the green areas are the objects of transformation, the broader context cannot be separated to achieve the intended impact of the activities. The effects of these transformations extend beyond the physical properties of the built environment, prompting thoughts about how to reframe the notion of “what was” in the light of what the place can become and who is involved in the process. Introducing participatory approaches and using creative tools provided a method for engaging and making tangible outputs that stakeholders might use in subsequent processes.



Figure 7. workshop in Ziepju. Photo credit: author

Building and establishing trust in the collaboration was pivotal for the exchanges between facilitators, experts, teachers, and pupils in Gadehavegaard. The relationship between participants and facilitators appeared to be nurtured through close engagement over an extended period. Awakening the pupils to tools and perspectives on their neighborhood supported forming their solutions and ideas, focusing on the park as an area where they would like to be in their free time – balancing a destabilization of a human-centered gaze while materializing their wishes. In Ziepju, participants were prompted with images of outdoor area things; some were left blank so they could add to them. Nevertheless, relationship building was also crucial here, and we noticed how the team was curious to see how the involvement activities would be received. Indeed, approaches to inviting citizens into the design process are novel in the context of transforming Soviet-era housing areas in Latvia to foster agency.³¹ The renovation of the housing block on Ziepju Street 11 is intended as a best-practice example of breathing new life into buildings in various states of disrepair. The focus is on involving and empowering the community while acknowledging that green spaces are an important element of this process.

DISCUSSION

In this paper, we asked about the potential of activating landscape and participatory design to explore more-than-human perspectives of livability in social housing transformation projects. The transformation processes we have presented are venues for opening debates about the more-than-human rights to our living spaces and how such perspectives connect with that of increasing livability in social housing areas. Our findings open new questions in discussions on livable communities that ensure plural perspectives of places.

Considerations on ensuring more-than-human in livability discussions

To shift design orientation towards a more-than-human perspective implies a pluriversal design agenda, where multiple worldviews are included³² Our findings build on this direction by showing the ‘indirect’ ways of framing the challenge of designing with multiple perspectives in social housing transformations, balancing the need to nurture community/placemaking while seeking to decenter a solely human gaze. Existing structures in places (legal, social, regulatory) might already honor more-than-human perspectives, for example, by building around and protecting trees as we noticed in the site of Ziepjju. This can be connected to Jessen & Tietjen’s observation of the effects of welfare landscapes, which extend beyond their place of origin and reverberate through time as the positive influence of green and open spaces on, e.g., child development.³³

Our findings shed light on some of the barriers to bringing in design concerns of creating and designing green spaces with nonhuman concerns. As we noticed in the case of Ziepjju, one barrier could be a newness to participatory culture, which might have to be nurtured to expand towards more-than-human. Secondly, tools to involve more-than-human perspectives might be missing. Thirdly, designing with the more-than-human might be challenging, and how to make the experiences of nonhuman stakeholders palpable poses a different way of understanding. A fourth barrier may be found in the premise and framing, which conditions the scope of the transformation, what can be achieved, and, importantly, for whom in the first place. To summarise, both cases aim to go beyond an anthropocentric perspective within their respective setting. They take their departure point in humans’ needs and wishes and combine design approaches to introduce the ambition of designing thriving green spaces alongside potential social benefits: the wish to open the design of future landscapes to impact the environment and local communities positively.

We believe these initial steps of framing landscapes with communities through a human-centered lens, where more-than-humans are being accommodated, might be needed to access design steps with nonhumans and experiment with accessing knowledge layers beyond humans.³⁴ Priming aspects include building confidence in methods, fostering new (human) relations, and building trust (e.g., by bringing together stakeholders who are not accustomed to interacting and designing together), establishing vocabulary and mediums that provide an entry point to involving non-human perspectives (photography, expert knowledge).

CONCLUSION

The potential of activating landscape design and participatory design processes to explore more-than-human perspectives of livability in social housing projects lies within the field's ability to 1) frame and inspire pathways to urban futures with multiple perspectives, 2) surface and materialize these through various methods that visualize and unfold futures of livable communities, 3) intentionally planning processes, spaces and moments that balance the complexity of local context while providing formats for discussion and including multiple perspectives. We acknowledge the limitations of our study and see our findings as an invitation to question and open the debate about what it means to design with

more-than-human concerns and livability in collaborative design processes and social housing transformation.

NOTES

- ¹ European Union, "New European Bauhaus Compass."
- ² Appleyard, "Livable Streets: Protected Neighborhoods?," 106–17.
- ³ Ahmed, El-Halafawy, and Amin, "A Critical Review of Urban Livability," 165.
- ⁴ van Dorst, *Liveability*, 223.
- ⁵ van Dorst, 223–41.
- ⁶ Biswas, "A Conceptual Framework to Visualise Liveability," 793–817.
- ⁷ Heylen, "Liveability in Social Housing: Three Case-Studies in Flanders ."
- ⁸ Ahmed, El-Halafawy, and Amin, "A Critical Review of Urban Livability," 165.
- ⁹ Appleyard, "Livable Streets: Protected Neighborhoods?," 106–17.
- ¹⁰ Sheikh, Foth, and Mitchell, "More-than-Human City-Region Foresight: Multispecies Entanglements in Regional Governance and Planning," 642–55.
- ¹¹ Jessen and Tietjen, "Assembling Welfare Landscapes of Social Housing: Lessons from Denmark," 474–94.
- ¹² Clarke et al., "More-than-Human Participation: Design for Sustainable City Futures," 60–63.
- ¹³ Akama, Light, and Kamihira, "Expanding Participation to Design with More-Than-Human Concerns," 2020, 1.
- ¹⁴ Akama, Light, and Kamihira, 1.
- ¹⁵ Akama, Light, and Kamihira, 1–11.
- ¹⁶ Mmako, Capetola, and Henderson-Wilson, "Sowing Social Inclusion for Marginalised Residents of a Social Housing Development through a Community Garden," 350–58.
- ¹⁷ Sendra, "The Ethics of Co-Design," 1–19.
- ¹⁸ Raaphorst et al., "Visualization, Participation and Rhetoric: The Discursive Power of Landscape Design Representations in Participatory Processes," 42–53.
- ¹⁹ Raby and Dunne, *Speculative Everything. Design, Fiction, and Social Dreaming*.
- ²⁰ Westerlaken, "It Matters What Designs Design Designs: Speculations on Multispecies Worlding," 137–55.
- ²¹ Dunn and Cureton, *Future Cities: A Visual Guide*.
- ²² Westerlaken, "It Matters What Designs Design Designs: Speculations on Multispecies Worlding," 137–55.
- ²³ European Union, "New European Bauhaus Compass."
- ²⁴ See more here: <https://www.irresistiblecircularsociety.eu/>
- ²⁵ Harre et al., "Narratives of Irresistible Circular Futures."
- ²⁶ Kokkegaard, "GXN: Design Is Not about Hocus Pocus."
- ²⁷ Harre et al., "Narratives of Irresistible Circular Futures."
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DISMANTLING BARRIERS AT INTERNATIONAL AIRPORTS: AN INTERSECTORAL PARTNERSHIP APPROACH

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INTRODUCTION

In 2022, nearly 27% of Canadians were affected by one or more forms of disability.¹ The scale of this phenomenon reminds us of the importance of placing inclusion and accessibility at the heart of our priorities. This is especially true in international airports, because they are playing an increasingly important role in the lives and well-being of people everywhere. While they are developing at a tremendous pace, the growing complexity of international airports poses major inclusion challenges for people with disabilities (PwD).

This article presents the initial reflections of a collaborative, multi-perspective project focused on improving the inclusion and participation of PwD at Canadian international airports.

International airports serve as vital hubs for global mobility and economic activity. Airports are not merely physical spaces; they are places where people connect, discover, grow professionally, or thrive.² Similarly, a vast array of individuals uses this space, including workers, tourists, students, families, companions, caregivers, refugees, politicians, airport staff, business operators, and many others. The sheer number of individuals navigating this space and the multiplicity of meanings for its uses highlight the necessity for airports to adapt and embrace the diversity they encounter.³

PwD are an integral part of this diversity. Indeed, the Canadian Disability Survey of 2022 indicates that approximately 27% of Canadians aged 15 and over experience some form of disability. People with disabilities (PwD) encounter distinctive challenges associated with social participation and opportunities. A substantial proportion of PwD report experiencing disabling situations on a daily basis, including while travelling by air.⁴ Furthermore, they do not benefit from the same employment opportunities as individuals without disabilities. As evidenced by data from the Canadian Disability Survey of 2022, the employment rate for adult PwD (65.1%) was lower than that of individuals without disabilities (80.1%). The disparities are even more striking when the severity of the disability is taken into account.

In order to mitigate these challenges, the promotion of accessibility and inclusion is at the heart of political priorities.⁵ Governments, regulators, and airport managers alike are working to regulate airport practices from an equity perspective. To assist in the design of facilities and the development of appropriate services, laws, standards, and guides are made available. For example, the Government of Canada issued the Accessibility Canada Act in 2019 to make the country barrier free for PwD in 2040. However, significant challenges remain at airport facilities. These extend beyond the inadequacy of the

physical environment to encompass various social and systemic barriers. In addition to air travel, airports host a wide range of activities, including passenger logistics, personnel management, and catering services. The broader the scope and functions, the more complex the factors influencing accessibility.⁶

Several dimensions affect the quality of the travel experience. First, there are the challenges in the physical environment. Among other things, the size of terminals and complex wayfinding systems can make navigating the physical space difficult.⁷ The numerous stages, waiting times and uncertainties of the journey can create significant stress, particularly for PwD.⁸ Furthermore, airports receive large numbers of people, both travellers and workers. The presence of other travellers creates a unique challenge for organizing and supporting PwD navigation.⁹ The multiplication of interactions required poses a planning and implementation problem where the slightest error can jeopardize the entire journey. These numerous obstacles can lead to unpleasant, painful and sometimes even humiliating travel experiences.¹⁰ As a result, many people with disabilities are reluctant to travel by air, even when it is necessary.¹¹

At the same time, the work context and opportunities for PwD deserve special attention. Working at an airport presents many challenges. Workers have to cope with difficult working conditions and strong pressure to respect safety standards and regulations. They also have to show great flexibility and agility in dealing with passengers and the many unforeseen situations.¹² Like many work environments, airports are not immune to the challenges of integrating people with disabilities. Environments that are poorly adapted to accommodate PwD can exacerbate already significant employment challenges.¹³ Ultimately, disabling situations in the workplace can exacerbate inequalities between PwD and people without disabilities.¹⁴

THE INCLUSIVE AIRPORTS PROJECT

Objective

This is the foundation upon which our research project is centered. The "Inclusive Airports" project is an initiative aimed at facilitating the inclusion of PwD when traveling or working in a Canadian international airport.

Methods

The project is based on a co-design approach.¹⁵ Co-design is a partnership process in which relevant stakeholders collaborate to design creative solutions adapted to the context under study. The valorization of ideas and stakeholder commitment is sustained through four stages.

Stage 1 Exploration

The aim of the first stage is to better understand and delineate inclusion issues at airports, through the experience of PwD. Considering the diversity of relevant perspectives and the complexity of the context, three methods are used.

1) First, three scoping reviews are conducted,¹⁶ to document inclusion and accessibility practices in the physical, the social and the work environment of international airports.

2) Secondly, walk-along interviews¹⁷ are carried out directly at three international airports. Three airports were chosen to represent the different sizes of airports found in Canada. At each of these airports, 24 participants (72 in total) with a variety of disabilities (motor, sensory, cognitive, intellectual) simulated the steps required for air travel. At the same time, they commented on the obstacles, facilitators and potential solutions they would like to see in place. In parallel, semi-structured interviews (n=24) are conducted with employees from the main airports services entities.

3) Ultimately, the physical environment of the three airports under study is evaluated using the Rick Hansen Foundation Accessibility Certification (RHFAC).¹⁸ This tool offers a comprehensive assessment of the physical accessibility of the infrastructure, encompassing both interior and exterior design elements, such as car parking lots and service counters.

Stage 2: Co-design

The second stage aims to identify solutions for inclusion at the airport. Diverse PwD who participated in the walk-through interviews will discuss the issues identified in Stage 1 in co-design sessions (n= 6 participants per airport). They will comment on the relevance of the solutions presented in Step 1 and suggest new ideas. All groups will be recorded and subjected to descriptive analysis¹⁹ to highlight the reasoning and contributions that led to the solutions.

Stage 3: Validation.

Following the co-design, the project's airport partners (those responsible for operations and services) will assess the feasibility and applicability of the proposed solutions. One validation session per partner will be attended by 3 to 6 people. A descriptive analysis of the discussions will highlight opportunities and constraints for implementing the solutions.

Stage 4: Development.

Finally, all validated solutions will be translated into recommendations and guidelines for each of the project partners and the Government of Canada. Each partner will receive a report with customized recommendations for improving their respective services. An overall report will be sent to Accessibility Standards Canada,²⁰ which is funding the project. The recommendations will be used to develop the next generation of accessibility standards and to guide airport institutions in complying with the new legislation.

Figure 1 outlines the key stages of the Inclusive Airports project.

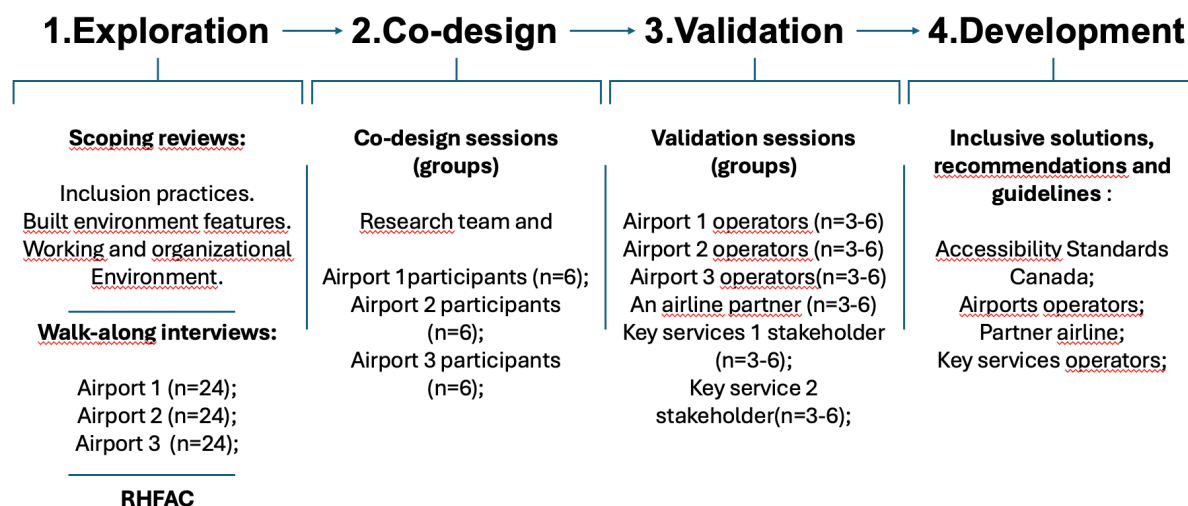


Figure 1. Inclusive Airport Project

RESULTS

As of August 2023, the research team is continuing Stage 1 exploration and has completed two of the three scoping reviews, as well as data collection at two airports. The preliminary results of these stages are presented in this article. This section first presents certain key issues so far, concerning the physical, social and organizational context of international airports. Next, some of the traveling and working experiences of PwD are discussed.

The Challenges of the Physical Environment of International Airports.

The physical environment is central to accommodating the large numbers of people and activities that take place in airports. They must be designed to meet the diverse needs of their visitors, including PwD.²¹ For example, for people with motor disabilities, spacious elevators and well-placed ramps allow for easy movement. Hearing impaired people benefit from quiet spaces for communication and clear signage, while autistic individuals find comfort in quiet environments with soft colors and open spaces that reduce excessive sensory stimulation.²²

Despite accessibility efforts, many barriers remain. Notably, for wheelchair users, self-service screens and check-in counters are often placed at inappropriate heights, complicating access. Visually impaired travellers face a lack of audible cues and sometimes blinding lighting that makes navigation difficult. Hearing impaired passengers must contend with noisy environments that make it difficult to understand important auditory information. Finally, autistic people may be disturbed by strong smells and the impossibility of anticipating the travel process.

The Social Environment and the Challenges of Human Assistance

Airports welcome large numbers of people every day. The presence of other passengers can act as a barrier to access for PwD.²³ But the social environment is also the most used strategy for compensating the accessibility issues of the physical environment.

While assistance often makes travel possible, many barriers can compromise its effectiveness. First, the mandate to provide assistance at airports is divided among several actors.²⁴ As a result, passengers have to coordinate services with multiple organizations and go through multiple transitions during their journey. These transitions can result in significant delays or even gaps in the travel chain. Second, high demand can exceed staff capacity. While airports strive to provide systematic assistance to PwD, there is no guarantee that it will be available at all times and within a reasonable timeframe.²⁵ There may also be variations in the quality of service provided. While some passengers may benefit from exemplary service, others may encounter assistants who are ill prepared to meet their needs.²⁶ Finally, services are not very flexible. Assistants are often trained to provide a "one size fits all" service, regardless of individual preferences and diversity. In particular, it's not uncommon for people with visual impairments to be offered a wheelchair to get around, regardless of their preference (e.g., voice or arm guidance).²⁷

The organizational environment: the delicate balance of the travel chain.

The organizational dimension of international airports is equally complex. To begin with, the complexity of the passenger journey makes the process fragile: a simple incident at one stage of the journey can jeopardize the entire process of planning and organizing the other stages. Safeguards and guarantees to compensate for unforeseen events are difficult to implement.²⁸

In addition, access to and training of personnel for service provision is a major issue at most airports.²⁹ Although many offer specific training to their staff, recruitment and employment conditions can reduce this effort. Organizations must overcome high staff turnover and a lack of trained staff for PwD. In addition, assistants often have suboptimal working conditions (irregular working hours, low wages and

high physical demands). Poor access to the workforce and demanding conditions create significant stress for remaining workers.³⁰

Finally, the human resources network at airports is vast and diverse. Each entity has a clearly defined mandate, different realities and a different regulatory framework. The difficulties inherent in compromising and combining these mandates can create synergy problems. Differences in the objectives of the various players, communication problems and misunderstandings of each other's roles can undermine the continuity of operations.³¹

The impacts on the travel experience of PwD

The situation at different levels of the airport environment has important consequences for the experience of travellers with disabilities.

On one hand, passengers who face disabling situations in the physical environment and need assistance must plan their journeys more extensively than others. Indeed, accessibility services often require reservations and extra time for deployment.³² This approach places a significant burden on PwD to ensure their travel plans are successful, emphasizing personal responsibility. Many organizations explicitly state that passengers are responsible for making necessary arrangements, which contradicts legal frameworks advocating equal opportunities for PwD. Moreover, the lack of clear information about accessibility services often hinders effective preparation. For example, generic terms like "accessible" provide little insight into whether services will meet individual needs. Heathrow Airport in London stands out for acknowledging the challenges PwD may face, such as delays and regulatory issues.³³

On the other hand, the inadequacy of the environment often implies the systematic use of alternative channels, specialized services and a different travel route from other passengers. This situation can lead to a feeling of marginalization, and even dehumanization, where individuals feel like a burden or luggage. The dehumanizing nature of travel is one of the main reasons why PwD often avoid traveling.³⁴ This stems from a prevalent medical perspective that focuses on the disability itself rather than the person. This disability-centric approach results in services that are impersonal and fail to respect the individuality and agency of passengers.³⁵ Moreover, the focus on what PwD cannot do rather than their strengths add to the burden of travel, forcing them to preemptively analyze their limitations for each stage of the journey. In addition, the language used in airports is often stigmatizing, with terms like "weak", "challenged" or "mobility impaired", reflecting a narrow view of their abilities and emphasizing mobility needs over other important aspects.

(The absence of) workers with disabilities.

At this time, we have not had the opportunity to meet any workers with disabilities. In addition, it is difficult to identify literature that focuses on the inclusion of workers with disabilities in airports. For many, the high demands of airport jobs and the challenges posed by the complexity of the environment may give the impression that it is not possible for PwD to work in this context. However, some people nuance this perception and consider that PwD could work in certain positions that are considered less demanding, with adaptations. That said, potential inclusion strategies are not widely known in the workplace. This large gap in support is an important opportunity to reflect on preconceptions about work requirements. The absence of workers with disabilities at airports means that we need to challenge the status quo and address the factors and biases that affect access to employment.

One promising approach could be to centralize these assistance services to simplify access and efficiency. Also, the inclusion of PwD in high-level decision-making positions could encourage the emergence of inclusive organizational methods and strategies. Several airports around the world have already begun this process. For example, Equal Skies Charter, a collaboration between several UK-

based aviation organizations to improve industry accessibility, have launched a research project to explore the experiences and opportunities for disabled employees in the aviation and aerospace industries.³⁶

Reconciling these perspectives: a fundamental rethinking of the design and vision of disability in airports.

International airports are undeniably making efforts to promote accessibility. However, most of them unwillingly focus on adaptations rather than true inclusion for PwD. This approach often stems from a cultural view of disability that emphasizes compensation over inclusion, at the price of the travel experience. Rather than just meeting minimum legal requirements, there is a growing call for airports to adopt a more inclusive mindset that puts passengers at the center.³⁷ Toronto Airport, for example, has emphasized the need for organizations to adapt to the needs of passengers, rather than expecting passengers to adapt to the environment.³⁸ It is important for airports to recognize how the design of their environment perpetuates the normative culture of space use. In fact, the reasoning behind the design directly influences how disability is perceived by users.³⁹ A paradigm shift in disability's vision is a current priority for airports, both in the physical environment and in service management. This means, foremost, considering the individual strengths, uniqueness and potential to contribute.⁴⁰

First, at the level of the physical environment, designs must be customizable, adaptable and flexible. Both individuals and communities' needs must be considered.⁴¹ This requires a change of perspective, involving PwD directly in the design process. This collaboration avoids the potential pitfalls of superficial solutions. Instead, it enables the creation of truly inclusive environments that adapt to the diverse needs of users.⁴²

Secondly, services need to be more flexible and integrated in order to limit the burden on passengers' shoulders. Expressing needs should not, paradoxically, add to the complexity of the travel. Staff should also be able to skillfully and respectfully explore the unique needs of passengers.

CONCLUSION

The Government of Canada has set an objective of achieving nationwide accessibility and inclusivity by the year 2040.⁴³ This project constitutes a further contribution to that effort. It is the result of an initiative by Accessibility Standard Canada to rethink the standards governing design and organization in public infrastructures. Cole et al. emphasize that merely meeting legal requirements is not sufficient. They call for increased awareness and education to combat stigma and create more inclusive approaches. A critical reassessment of current practices is imperative to prevent dehumanizing experiences and to ensure that individuals with disabilities (PwD) benefit from respectful services and personalized spaces.

Improving inclusion at airports is a collective responsibility that requires the commitment of a wide range of partners. Indeed, the physical, social, and organizational context, as well as the complex nature of travel, are all interacting factors that require a wide range of expertise. In order to fully understand and act on the factors affecting inclusion and participation in airports, professionals, decision-makers, frontline staff, and PwD must work together, both in research and in the field.⁴⁴ By involving all those directly concerned, more creative, innovative, and contextually relevant action can be achieved. In that perspective, the Inclusive Airports project has the objective of developing solutions that value the diversity and capabilities of individuals. Our partners are committed to creating more inclusive spaces that are respectful of the human beings who work or travel there.

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SOCIAL INFRASTRUCTURE AS NORMATIVELY CONTESTED: CAN *CULTURAL VALUE* HELP?

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INTRODUCTION

Social infrastructure – defined by its promotion of “sociability” and support for “meaningful relationships” – has proliferated public policy discourse in the UK.¹ The underpinning aspiration is to attract investment to deliver on multiple policy agendas. When approached this way, social infrastructure becomes a policy-making tool valued for its effectiveness in achieving goals such as reducing regional disparities and strengthening communities. One issue with this, we argue, is the need to formalize and idealize the concept of social infrastructure. This often obscures that social infrastructures are normatively contested, with different user groups having different norms and agendas. In this paper we ask how the fragmentation reflecting the real state of most communities and the fact that the forms of sociability and relationality promoted are always selective in some sense - can be factored into the policymaking anchored in the idea of social infrastructure. We argue that Social Value approaches used in policymaking should be supplemented with cultural value interventions which can ensure that different normative orientations are represented in the relevant decision-making processes.

Why should decision-makers care?

Policymakers aiming to make decisions with and for communities, rather than just for the most visible or vocal sub-groups, must find ways to include those typically left out. This inclusion must happen without filtering their perspectives to the point of making them unrecognizable. Even more so, if local planners aspire to designing places that are public – some awareness is needed of who is included and who is out. The challenge lies in accounting for differences while still orchestrating a collective approach.

Methodological Contribution

To address this challenge, this paper offers a methodological contribution. It adapts an existing asset-based spatial approach to evidencing Social Value at the neighbourhood scale.² The paper tests whether considering cultural value³ in collaborative mapping practices can accommodate divergence and dissent while maintaining a collective objective. This approach can enable policymakers and decision-makers to view social infrastructures as normatively complex. This ensures that decision-making tools do not merely “paper over” the real differences characterizing most London communities, which social infrastructure should support.

SOCIAL INFRASTRUCTURE: AS LIVED AND IDEALIZED

Urban infrastructure scholarship has traditionally focused on platforms connecting people through physical and virtual spaces. Key concerns include investments in transport, communication, sanitation, and energy systems by multi-level governments and the private sector.⁴ Infrastructure can reinforce urban inequalities through uneven resource distribution, the circulation of knowledge, and the mobility of people and goods. These inequalities stem from governance decisions, urban categorizations, and the design of technical objects.⁵ Infrastructure straddles the physical and intangible domains of urban space, unifying and dividing communities. It can solve but also create urban environmental problems, resulting in spatial disadvantage and inequity. Interdisciplinary scholarship views infrastructure not just as systems providing essential services but as part of everyday lived experiences. People become infrastructure when they collectively create possibilities outside formal planning and governance frameworks. Space becomes infrastructure when it supports collective activities.

Social infrastructure is now a significant concept in policy-making in which context it is linked to the development of social capital.⁶ Social capital can be here understood as “networks of relationships between individuals, built on mutual trust, understanding, and reciprocity”.⁷ Indeed, the notion of social connectedness seems central. The definitionally presupposed relationships are assumed positive, trust-reinforcing and meaningful – see, for instance, the Bennett Institute for Public Policy’s definition of social infrastructure as “those physical spaces in which regular interactions are facilitated between and within the diverse sections of a community, and where meaningful relationships, new forms of trust and feelings of reciprocity are inculcated among local people.”⁸ This is an idealised understanding – most social infrastructures at local scales are contested sites where relationships do not always align as policy suggests. This corresponds with urban environment literature showing that infrastructures, as practiced, are normatively contested.⁹

Social Infrastructure and Different “Orders of Worth”

Recent research shows that social infrastructures often involve conflicting interests and can be sites of exclusion,¹⁰ this, in particular, in *superdiverse societies*.¹¹ Social infrastructures reveal colliding individual needs, ambitions, notions of power, autonomy, dependence, and evolving visions of what constitutes collective and social norms. Experienced through contestation, social infrastructures can be characterized as “agonistic” – emphasizing the positive aspects of conflict and accepting its permanence.¹²

Convention theory’s “orders of worth” – elaborated in the writings of Boltanski and Thévenot and others – help characterize the lived reality of infrastructures.¹³ These are ways of sustaining social orders around different normative ideas and ideals. Higher order principles, such as price, technical efficiency, collective welfare, reputation, creativeness, fame, and environmental friendliness – are mutually incompatible but can justify individual positions within a community. Pursuing different goals by different individuals likely results in agonistic and contested social spaces. The challenge is building and supporting social infrastructure under these conditions.

SOCIAL AND CULTURAL VALUE IN SUPPORT OF INFRASTRUCTURING

This paper aims to support decision-making and policymaking in relation to social infrastructures understood in more realistic terms, that is, as normatively contested. It adopts an asset-based spatial approach to evidencing Social Value and incorporates cultural value to challenge assumptions. This approach accommodates multiple perspectives within any social infrastructure without presupposing that all users will have equally meaningful interactions with each other, it thereby supports more inclusive decision-making.

Evidencing social value

In a British context, Social Value stands for a set of approaches developed to explore how to use limited resources for maximum collective benefit, beyond cost savings. The UK's Public Services (Social Value) Act 2012 mandates local governments to consider economic, environmental, and social benefits when procuring services. These benefits should align with local needs, such as reducing anti-social behaviour, increasing local employment, or reducing congestion.¹⁴

Implementation challenges persist. Typically, the construction industry measures social value in terms of jobs and apprenticeships, with less focus on the social value of designed elements.

Organisations like the UK Green Building Council and the London Sustainability Commission are developing high-level measurement standards. The Royal Institute of British Architects publication of its recent Social Value Toolkit for Architects¹⁵ refers to the work outlined in this paper.

Despite the Social Value legislation and the various initiatives, barriers persist. While these are often said to include a lack of awareness and agreed measurements, we note that standardising social value through frameworks risks oversimplification and checkbox compliance. This is relatively unexplored terrain and complements current studies into place value.¹⁶

Experiencing cultural value

Historically, the discourses of urban planning, built environment and space practices have seen culture as a resource. Culture, we are told, “attracts, sells, brings people together, entertains, appeals, and impresses.”¹⁷ Within the urban planning corpus, culture has been primarily valued as a representational by-product of the social that can be used to serve other goals. Similar to social infrastructure in contemporary policy, culture is seen as a symbolic resource employed for urban political and economic agendas, sometimes masking issues like exclusion, surveillance, and displacement.¹⁸ However, culture can also support interpretation and collective agency in an open-ended manner.¹⁹

We define cultural value as a non-monetary expression of the value of culture, traditionally linked to symbolic representation and aesthetic appreciation.²⁰ Key dimensions include cognitive, aesthetic, and emotional resonance experienced in social contexts and the promotion of collective meaning-making.²¹ Cultural value is not inherent – it is constructed through interpretation and shaped by cultural norms and institutional expectations. It gains validity through *shared* subjective experiences.

We propose that cultural value can create spaces for interpretation where different agendas and assumptions can be presented and left to co-exist. This is of value in decision-making. As our case study illustrates, the contestation of whether something like a planter with children's art, a community event, or a playground decoration – is culturally significant and what meaning it has, can form the foundation for more inclusive understanding of social infrastructure.

CASE STUDY

In order to test and empirically develop the methodological proposal of this paper we conducted a mapping study, as described below. The activity drew on the skills and expertise of the authors in response to a site in North London, where emergent community initiatives had successfully secured funding to make local improvements to a play area.

About the site

Stanley Culross Open Space is located in Haringay, North London. The open space contains a fenced in primary school, children's nursery, and some public green space. The space is surrounded to the west by terraced housing built in the 1900s, and a newer housing estate to the east, constructed in the late 1970s. To the north of the space is a “paused” construction site, where housing will be built. As part of the planning permission for this new housing, funding was provided through a Section 106 agreement

to renovate a rundown children’s play area at Stanley Culross. This area was collaboratively designed by residents, including children at the two schools overlooking the park: St John Vianney Catholic Primary School and West Green Primary School. It had its successful opening on the 18th of March 2024 (Fig 1). The opening event was orchestrated by a handful of residents - Friends of Stanley Culross (some of whom participated in this mapping study). Beyond the play area, community-led improvement initiatives have also taken place across the open space over the past five years. These have included: litter picking; bulb planting; the installation and decoration of planters with children’s art.



Figure 1. Photograph of the opening party for the new community-led play area.



Figure 2. Photograph of the bench flanked with 2 (out of 5) planters decorated with children’s art

The area has a mixed demographic. This backdrop is important to understand the character of the place – with the bench depicted above (Fig 2) used by both, middleclass families with children as well as local drug dealers.

Research approach, data collection and mapping

Through a series of three mapping conversations with local community leaders and participants in community-led activities, and a public mapping stall set up at the opening party of the play area, which gathered 112 public responses (Fig 3) – we created maps that situated values locally. The mapping

process allowed us to see where different points of view and interpretations overlapped and interacted spatially.



Figure 3. Photograph of the mapping stall at the opening party for the new community-led play area.

The approach taken in this study was an iteration of an existing method for Social Value (MESA).²² Through MESA, participants engaged with social value themes – such as connection, active lifestyles, positive emotions, taking notice, and flexibility and freedom – by placing stickers on a spatial representation of an area in response to prompts like “I feel happy here.” In addition to social value prompts, the activities described in this paper introduced two cultural value prompts: “This place is special to me” and “This place moves me.” This was done to test responses, anticipating that the method could be adapted to include cultural value registers, alongside social value. There was also potential overlap between social and cultural dimensions in prompts such as “I am proud of this place” and “It is beautiful here.” Therefore, the distinction between cultural and social was not emphasised at this time (Fig. 4).



Figure 4. The combined spectrum of social and cultural value prompts.

MESA thematically colour-coded prompts (blue – connection, orange – active lifestyles, yellow – positive emotions, red – taking notice, and green – flexibility and freedom). The iteration of the method

used for this paper deliberately removed thematic/categorical distinctions and placed all the prompts on a spectrum, aiming to support thinking of values as being interrelated and complementary, rather than in opposition (and/and/and rather than either/or).

Following the scoping activity at the public event and mapping conversations, multi-layered maps were created from each exchange and then combined into a single comprehensive map. This resulted in a composite heatmap of values across the case study site. The composite map (Fig 5) was subjected to further analysis and refinement. This process led to identifying specific locations of common concern and nodes of interacting values, highlighted on the map as overlapping colours and fuzzy spaces (Fig 6). Subsequently, a diagram was developed through abstracting nodes of interacting values, territories of aligned values, and pathways (Fig 7). The next phase of this research will involve using the diagram as a prompt in the conversation with the local community recognising that it is in itself an object of cultural significance (see the discussion of boundary objects below).



Figure 5. Composite map of Stanley Culcross locating social and cultural values spatially



Figure 6. A situation of common concern and node of interacting values revealed through mapping

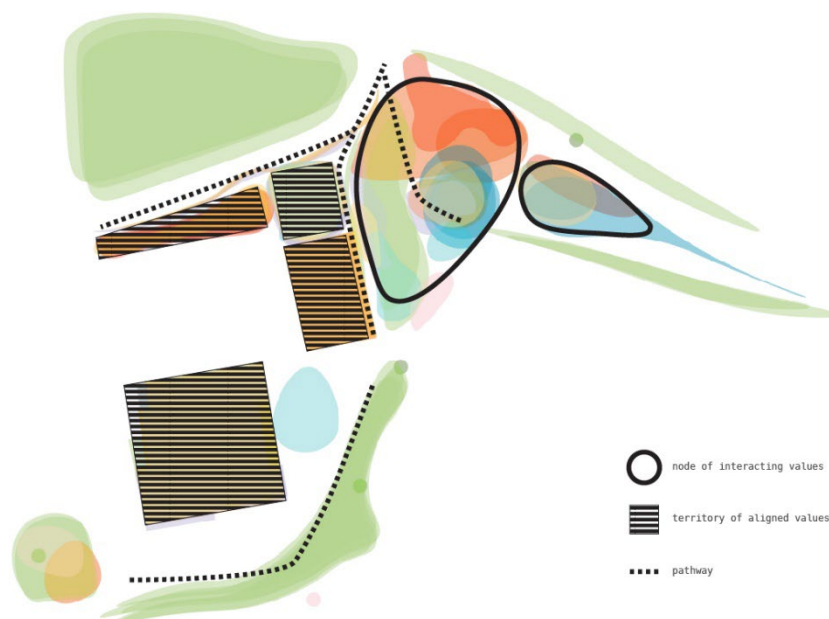


Figure 7. A spatial sociocultural infrastructure of value nodes, territories and pathways

RESULTS

Mapping values

The maps and diagrams showed values clustered in both agreement and discord at specific locations and scales. Social value was mapped at the everyday scale in places of interaction, while cultural value shaped the milieu of these moments.

Mapping activities revealed the difficulty in expressing cultural value. Social value, with its focus on outcomes, was easier to map. For instance, identifying spaces that “move” people was challenging, while preferred places for hobbies or meeting friends were easier to pinpoint.²³ The presence of cultural value, such as the cultural significance of the children’s art on the planters, enhanced the complexity of responses. The interpretative, open-ended space created literally through the placement of children’s art (Fig 6) — allowed us to capture the normatively contested character of the social infrastructure in formation. Through the mapping the following preliminary observations can be made:

Alignments of values

The mapping showed that in some areas value agendas aligned, these were: the wildflower meadow, play areas, and also areas for improvement, to the edges of the site and estate. However, the central space around the bench and patch of uneven grass was not characterised by value alignment. It was a congested territory that saw requests for mutual respect and to make space for everyone, implying that there was presently not enough respect and “shared” space.

Sharing territories

There was a clash between perceived anti-social behaviours, such as selling drugs and drinking, and more sociable ones, such as children playing. Who sets the rules for a shared bench? Is it a matter of too few places to sit rather than a need for stricter regulations? Considering the map as a whole, the concentration of different colours around the bench is striking. The bench is under pressure due to the different types of use value it generates throughout the day.

Situations of value

Despite concerns over shared use, the bench and planters provided opportunities for communicative exchanges and, at times, confrontations. These planters demarcated an outdoor room, with a pathway linking the site's north and south, acting as a core site where different orders of worth co-existed. As expanded in the next section, cultural value – understood as occasioning collective meaning-making – can accommodate divergent and dissenting ‘user’ voices of social infrastructures.

DISCUSSION

The case study of Stanley Culross demonstrates that its social infrastructure fits the discourse of urban environment more than policy. Thus, it calls for approaches grounded in lived experiences and capable of reflecting the complex realities of contemporary “infrastructures”. One implication of this is that, if public policy is to be genuinely public, policymakers need to recognize that social infrastructures are normatively contested.

There are three important findings from our case study relevant to decision-making:

(1) Not pre-empting whose “values” are considered

In complex, pluralistic societies, decision-making aligns with deeper patterns and norms linked to policy accountability and values of the electorally active majority. These are reflected in dominant Social Value approaches. Values outside the norm can become noticeable through more open-ended registers. In order to register a range of values co-existing in any social infrastructure, Social Value approaches need to be enriched with cultural value registers.

(2) Objects of cultural significance as boundary objects

Objects with cultural value, such as the planters with children's drawings discussed in the paper but also, we would argue, visual representations such as maps and diagrams (Fig 7) – can serve as “boundary objects”.²⁴ These objects support communication, sense-making, and meaning-making without pre-empting disagreement. They allow different normative orientations to coexist, facilitating diverse interpretations. Boundary objects are coordinating mechanisms that sustain attention from various viewpoints, fostering temporary groups and supporting sense-making because they hold different meanings for those involved.

(3) “Injecting” cultural value into Social Value approaches

Social value approaches, even though initially designed to capture subjective perception of value in communities, have evolved to be metric (focused on measuring things that can be measured) and categorical/discrete (operating with specific thematic categories often established in terms of policymakers care about, rather than reflecting the interests of local communities). In this paper we argue that Social Value approaches should be supplemented with cultural value interventions where objects of cultural significance are used as boundary objects. This is because the latter, in contrast to the former, are interpretative and embrace fuzziness (fuzziness here understood as the quality of being indistinct and without sharp outlines); moreover, they allow for different normative positions to be included and contested.

Our methodology supports policymaking by highlighting diverse values and fostering inclusive discussions, ensuring that multiple perspectives are considered in the decision-making process. This approach can reveal new ways of understanding and demonstrating value which can and should inform decision-making and planning.

CONCLUSION

This paper addresses a number of issues arising in relation to social infrastructure, starting with the two central ones:

- a) the need to measure the value of social infrastructure in terms that are compatible with the approaches used in decision-making which carries the risks that the metrics adopted will not reflect the perspectives of the first-hand user;
- b) the tendency to conceptualize infrastructure in idealized terms rather as a social phenomenon that remains fundamentally contested (with different group of users having different agendas responding to different norms).

In addressing these two concerns, the paper also moves discussion forward on two other issues: the Social Value measurement when “perverted” into a box ticking exercise; and, secondly, what has become known as the instrumentalization of cultural value in the context of decision-making (reducing the value of culture to a set of economic and social indicators) that betrays a lack of understanding for how engaging with culture leads to change.²⁵

We suggest that cultural value can create an interpretative space – literally and metaphorically – allowing for agonism, leading to a more authentic representation of social networks and potentially more stable and better-grounded social infrastructures.

Collectively, the arguments presented make a case for improving the decision-making processes involved in the provision of social infrastructure. The methodology offered can support this transition.

NOTES

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¹¹ Leyla Kerlaff and Emmaleena Käkelä. "Understanding good places to meet: the role of 'common interest infrastructures' in promoting social cohesion in superdiverse societies." *Social and cultural infrastructure for people and policy: discussion papers*, The British Academy (2024):97.

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¹² Chantal Mouffe, "Deliberative democracy or agonistic pluralism?." *Social research* (1999): 745.

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²² Eli Hatleskog and Flora Samuel, "Mapping as a strategic tool for evidencing social values and supporting joined-up decision making in Reading England". *Journal of Urban Design*. (2021) 26(5), 519-612.

²³ This can also be reflection on the character of the actual space and that there are not many locations that can be associated with the prompt "This place moves me".

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JOYS AND CHALLENGES OF NEIGHBOURHOOD PROJECTS: IS IT POSSIBLE TO MOVE FORWARD IN SHIFTING, COMPLEX CIRCUMSTANCES?

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INTRODUCTION

The case study addresses challenges of moving forward with positive change in shifting, complex circumstances. The project in Camden, London, is the Highgate Road shop parade.

It is originally listed in the *Neighbourhood Plan* (NP), of the Dartmouth Park Neighbourhood Forum (DPNF) within Project 7: Public Realm in Neighbourhood Centres.¹ It was identified as needing protection and improvement. After an initial photo survey walkaround (see Figure 1), the DPNF team progressed a design proposal for this public space.

Complexity results from several different stakeholders and influences. Factors include: clarity over land ownership; programme -aside from the obvious Covid; project management and involvement -volunteer skills vary from amateur to professional; differing agendas -general users vs residents vs retail; and funding challenges. Even this paper's author wears many hats: neighbour, architect/designer, academic, and member then Chair of the DPNF.

The question addressed is: How can one progress a Neighbourhood Forum initiated design to revitalise a shared external space, with many stakeholders and changing conditions?



Figure 1. Site photos Highgate Road shop parade, by Author

METHODOLOGY

Three approaches have been used in this study. First, key literature was identified and reviewed, associated with community projects and regeneration. Studies included examine participation success, ownership types, and team organisation models.

Secondly, the process of design for Highgate parade is reflected upon. This includes: brief development; architectural outputs -drawings and images; and Neighbourhood Forum outputs and community consultation.

Finally, qualitative analysis of user views is performed. This includes a stakeholder questionnaire and resulting conversations.

A "theme and explore approach" was adopted, which according to the National Council for Voluntary Organisations (NCVO) is a suitable method for a small sample size.²

LITERATURE

Participatory Placemaking Manoeuvres

Sarah et al. studied "processes involved in small-scale urban practices that engage community groups in participatory placemaking".³ According to them, successful pocket park projects have three processes: Tactics, Manoeuvres and Strategies. They have added Manoeuvres to de Certeau's identification of Tactics and Strategies as part of a process for change. Tactics describes bottom-up activities, eg. those that engage and come from local communities. Strategies are classified as top-down activities coming from formal authorities, eg. government grants.⁴

Manoeuvres are placed between these, and is a process "in which tactics are undertaken strategically, and strategies are exploited tactically to negotiate and exploit formal processes to unlock the formal systems necessary to realize the project".⁵ So, between Tactics, initiated by informal groups, and Strategies, part of formalized processes, such as government funding or permission, is a mediating type of action. Manoeuvres enable "individuals to coalesce into quasi-formal collectives in order to manipulate" strategic mechanisms.⁶



Figure 2. Tactics, Manoeuvres and Strategies, from Sara et al., 19

Urban Agriculture (UA) Ownership

In "Modernist Projects of Community-Based Urban Farms in Residential Areas", Nowysz reviews types of agricultural and green land ownership from the industrial revolution to present. This includes case studies of farms within council estates. She identified three models of farmland ownership: "public, private, or cooperative".⁷ Groups involved in urban food production are classified as: "state (e.g., local authorities), non-state (e.g., non-governmental organizations), and informal (e.g., cooperatives of agricultural producers)".⁸

An interesting example is the Organopónicos Populares, Havana, Cuba. This includes gardens on empty lots, or farms 0.2- 0.5 ha (considered small for farming production). They serve the community and local retailers, and often includes a market stall at the gate.⁹ Such retail units may be of interest to urban communities of higher density.

Nowysz highlights, for "critics of UA: ...the agrarian function is not the key issue".¹⁰ A concern in urban areas instead may be ecological transposition -reducing food miles. Another may be the "social value of providing residents with access to food", eg. eg. for those who cannot obtain fresh, affordable food.¹¹ Obstacles to urban farms include higher "cost of urban land" as well as "pollution by heavy metals" from traffic.¹²

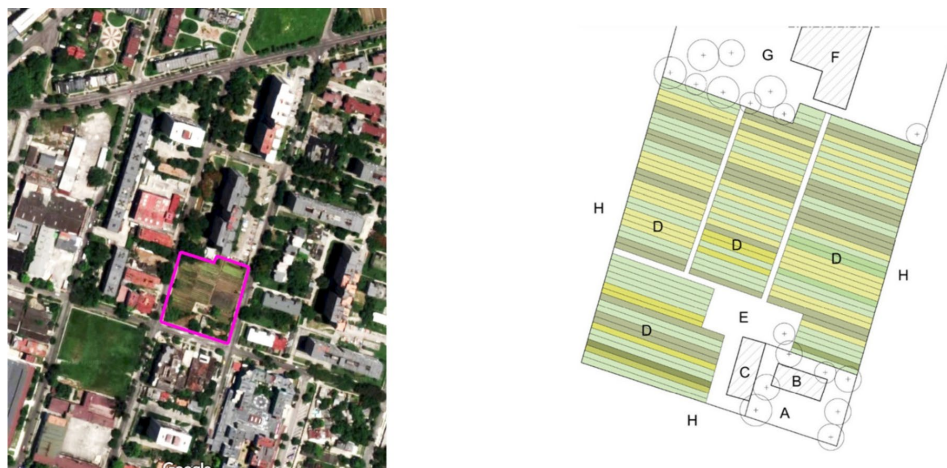


Figure 3. Above, Organopónico La Sazon, an exaple of Organopónicos Populares, from air and site plan, with crop beds noted as D and market stall as B, from Nowysz, 8

Participation

De la Cal states that the best design projects encouraging citizen participation and adoption follow a certain process or pattern. They arise "from a specific^[17] problem, one that has brought about social mobilisation".¹³ To solve the problem, communities receive "support from specialists or politicians who have played a coordinating, facilitating or supervisory role".¹⁴ Specialists should then 'give it back', empowering communities, and in the process ensure citizens "should know, understand and value the proposed design".¹⁵

An example illustrating this process is Luz nas vielas (Light on the Stairways), an art based project. Organized by Madrid art collective Boa Mistura, it is part of the global Crossroads project using "art as a tool to promote change".¹⁶ In their intervention, paint and positive words are applied to staircase walls in São Paulo shantytowns.

He states art is an effective medium for "bringing awareness". The key for him is process, it needs an appropriate design adapted to the location. With the stairways project residents spontaneously assisted to improve public spaces. He concluded: "Participation in the process and the feeling of community and empowerment contributed to the community's social cohesion."¹⁷



Figure 4. Painted stairway project encouraging participation, before and after, from de la Cal, 173

Organisation

Campo provides insight into methods of organization for local projects, in two case studies of abandoned rail stations in the United States -including surrounding lands. He investigates DIY urbanism, which includes grass-roots generated projects, community executed, hands on, and immediate. He asserts "DIY endeavors follow 'arcs of formality' –successful tactical or informal urban practices formalize over time or cannot survive".¹⁸

In each, project arcs had similar beginnings: locals came together, interested in making improvements, and actions were initially impulsive. Towards the end, both became more formal. In the first, Central Terminal, Buffalo, participants involved evolved into a formal incorporation fully controlling their building. They became the Central Terminal Restoration Corporation (CTRC) comprised of local residents, assisted by council members. In the second, Roosevelt Park, Detroit, the group became a recognised Coalition (non-incorporated) able to work with local developers and government. Membership includes a local champion/entrepreneur, architects, residents, and businesses. However, the latter still lack the full legitimacy to govern the public park.¹⁹



Figure 5. Roosevelt Park, proposed and community tactical intervention, from Campo, 369-370

HIGHGATE FOLD - REFLECTION

Actors

The Highgate Parade project, as noted above has a number of stakeholders and actors, see Table 1. Four groups can be identified, with overlaps between. Most are volunteers.

The DPNF Project Team initiated the project and developed the Outline Brief and Sketch Design. The Funding Team, including council members, were then instrumental in obtaining funds to pay professionals for Final Design Proposals. Final Proposals could be used as a basis for obtaining statutory permissions, and bring the project closer to a stage of construction. Through all stages, Community Stakeholders were asked to input.

Each project group has several 'specialties', or expertise, as table left hand column. In terms of 'interest groups' overall, there are at least twelve subgroups, on right hand column. Many of those involved have many differing and overlapping roles -part of several project and interest groups. For example, the author is on the DPNF Project Team, an Architect-Designer on the Design Team (also an Academic), an Adjacent Neighbour, and a DPNF committee member -so part of at least four different subgroups which may have conflicting agendas. Also, whether participants are paid or not, may influence level or frequency of participation -as they may have other demands on time.

KEY ACTORS DURING HIGHGATE PARADE PROJECT		
No. of Specialties /Group (min.)	Project Group	No. of Interest Groups overall (min.)
DPNF Project Team		
5	5no. Committee members including expertise as follows: Architect, Academic, Artist, Politics, Project Management	1
	(1 later left country)	
Project Funding Team: Community Infrastructure Levy (CIL) Application		
1	DPNF Project Team	
2	Counsellors	2
3	Camden Community Makers (also DPNF committee members)	3
4	Camden Council (including Planners) - <u>PAID</u> as council employees	4
Project Design Team (from sketch design to after CIL Funding)		
1	2no. Architects - one <u>PAID</u> (one DPNF volunteer)	5
2	2no. University of Hertfordshire students - <u>PAID</u>	6
3	Building Surveyor - <u>PAID</u>	7
Community Stakeholders - related to project		
1	Residents of Carrol and Sanderson Close (leaseholder, council and tenants)	8
2	Shopkeepers/ surgery commercial units Highgate Parade	9
3	Neighbours adjacent (including Kentish Town Neighbourhood Forum)	10
4	DPNF committee members	11
5	Dartmouth Park wider Neighbourhood / AGM	12

Table 1. Key Project Actors

Design Timeline

Work began in November 2020, after a DPNF Committee Meeting where it was agreed NP Project 7 should be developed if feasible. Just over three years later, by April 2023, Final Design options were completed. See Figure 6 for a visual of the Timeline to Final Design, and Table 2 for the Timeline including Community dissemination after Final Design completion.

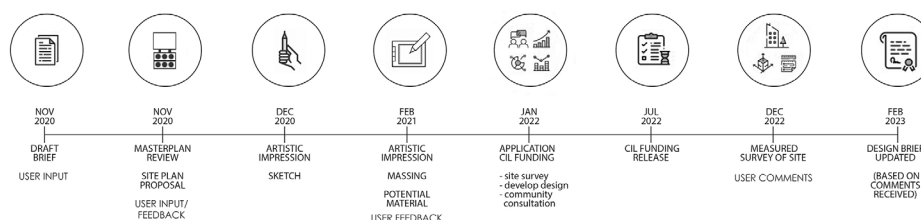


Figure 6. Timeline: Feasibility to Final Design only, as graphic, from presentation boards

User Input

There were at least four clear points where user input was sought, to contribute to development of the scheme: two during Feasibility, and two during Final Design development. The sketch design was also circulated via the DPNF Newsletter.

After the Final Design, there were four presentations to the community to elicit feedback on options created. Three were held on the estate directly to stakeholders. One was to the wider DPNF community during the Annual General Meeting (AGM) at a library.

TIMELINE - FEASIBILITY TO FINAL DESIGN			
Stage	Date	Activity	Project threat?
Feasibility	November '20	Highgate Parade Project begins	
		<u>User Input: conversations, emails.</u>	
		Draft Brief	
		Site Plans: Existing (analysis) and Proposed	
		General Note: Covid Government Lockdown (2nd)	
	December '20	Outline Brief and Sketch Design ' Highgate Fold'	
	January '21	General Note: Covid Government Lockdown (3rd)	
	February '21	Sketch Design Updated + Materials Proposed	
		<u>User Input: emails, zoom</u>	
	May '21	DPNF Newsletter - Outline Brief and Sketch Design	
Fundraising	January '22	CIL Funding Application Submitted: For Survey, Design Development, Community Consultation	
	June '22	<i>Council Confirms site is part of Carrol and Sanderson Close Estate, @ meeting with Camden.</i>	<i>threat</i>
	July '22	Funding Granted + Funds Released	
Final Design Development	November '22	<u>User Input: WhatsApp, Zoom. re: last Sketch Design</u>	
		<i>'Small Sites' Parallel Project: Carrol & Sanderson Close -Camden Council New Homes for Small Sites -TRA Start Campaign against.</i>	<i>threat</i>
	December '22	Measured Survey Completed on Site	
	February '23	Brief Updated	
		<u>User Input: Email. re: Brief + last Sketch Design</u>	
	Spring '23	<i>Camden decision on Small Sites. (18 Mar. DPNF Mins.) Carrol and Sanderson Close site cancelled</i>	
	April '23	Final Design Options Completed	
Community Feedback	03 May '23	Community Consultation- Highgate Parade	
	13 May '23	Community Consultation- TRA Community Hall	
	29 June '23	DPNF AGM - Location- Highgate Library Civic and Cultural Centre -Presentation of Highgate Fold CIL Project -Guest Talk Re: Highgate Studios Development Planning Submission: concerns raised re: overlooking in Q&A	<i>threat</i>
	Autumn '23	<i>Reports of Resident 'Development Fatigue' 25 Nov: DPNF Minutes report of resident reluctance</i>	<i>threat</i>
	13 March '24	Carrol and Sanderson Close AGM - Community Hall	

Table 2. Timeline: Feasibility to Post Final Design Community dissemination, as table

Feasibility Stage

The brief developed initially as a result team walkarounds, photographs, and incidental discussions with users. Later this was via email conversations and zoom meetings. In December 2020, an initial sketch design was developed (see Figure 7). The design was named Highgate Fold, a play on the term sheep fold, indicating a safe area to stay: it was believed shepherds used to graze their sheep nearby on Hampstead Heath, and the old Kentish Town Common. It also refers to the folding steps and seating of a partially enclosed public space. The scheme included greening, planters, repaving, public benches, and a social square.

The sketch was later updated, after community feedback, notably, benches were removed due to concerns of antisocial behaviour, also lighting was added. Amongst other improvements, new drainage was incorporated, addressing concerns of existing flooding.



Figure 7. December 2020, Sketch Design of Highgate Fold

Fundraising Stage - Service Charge Threat

In January 2022 the team applied for Community Infrastructure Levy (CIL) funding for development of the Final Design and Community Engagement, to move the project closer to a stage ready for statutory permissions. A six-month delay between application and funds received caused delay to programmed work -architectural students lined-up to assist during summer break, instead worked part-time during term.

In Summer 2022, a significant discovery was made while seeking future funding for construction, via Spacehive's match funding programme, part of Camden Council's Future High Streets Fund. After several Spacehive and Camden meetings, it became clear the land is not part of Highways, or the public realm, but part of Carrol and Sanderson Close council estate. Council and Spacehive representatives requested a working group to be set up made up of estate businesses and residents. Understandably, leaseholders were concerned with potential increased service charge to due to capital costs and maintenance if the project proceeded.

The Design Team had to press on to deliver Final Designs by the CIL spend deadline, and address future funding another time. The measured survey was completed, and Architectural Design and Brief was further developed towards Final Design.

Development Fatigue - Threat

In parallel to the Final Design Stage, two new developments affecting residents threatened the project's future.

In Autumn 2022, a project was launched by Camden Council 'New Homes for Small Sites'. The carpark on the Southwestern border of the estate was being considered for new housing.

Additionally, in the Summer of 2023 developers Hondo who own Highgate Studios on the Southeast border, proposed extensions to their buildings. This included a tower that was considered to overshadow and overlook residents on the estate.

Estate Tenants and Residents Association (TRA) volunteers campaigned against both of these proposals with some success. The council dropped the proposal for the housing on the carpark. Planning permission for the Tower is still pending.

The DPNF Highgate Road project is to the Northeast, in effect there was potential future development on three sides of the estate. Though intentions were benign to improve the area for residents, residents may have felt penned in, affecting their reception to Highgate Fold.

FINAL BRIEF FOR HIGHGATE FOLD		
Key Principle	How Addressed	Additional Ongoing Maintenance?
<i>Generally improve the outdoor space:</i>		
	Add new green/ planting	
	Remove/ cut back overgrown existing planting	
	Add/ replace hard surfaces, ensure are level for access	
	Add a new staircase for better circulation, in middle of parade	
	Improve railing safety, guarding design could be linked to pastoral history (eg. sheep)	
	Provide amenities for community (see below)	
<i>Encourage positive and responsible use:</i>		
	Introduce lighting	
	Have good visibility, not overgrown.	Yes (seasonal pruning)
	No large areas of general seating	
	Seating for elderly/ patients, those who need it	
	Keep cycle parking, add more if possible	
	Add a bin	Yes (to empty)
<i>Low maintenance:</i>		
	General planting to be low maintenance, to consider robust native plants that may thrive.	Yes (not often, quarterly?)
	Materials to be robust, long lasting	
	Potential for planters to be adopted by shop parade unite: eg. associated with NHS/ Doctor's surgery, patients use	If adopted by shops, then No
<i>Greening:</i>		
	Keep existing trees	
	Add more planting generally	
	Aim to provide a nature corridor, to link to other adjacent green spaces, include local plants.	
<i>Prevent flooding:</i>		
	Permeable paving	
	Rainwater attenuation due to new planters, soil and plants	
	Replace existing drainage grates, and channels	Yes (yearly?/ as advised by manufacturer)

Table 3. Final Brief

Final Brief and Design

Moving back to the timeline, the Final Design was completed in April 2023. See table 3 for the Final Brief. The key principles are to improve the space: its safety, circulation and for visual pleasure. Positive use is encouraged, responding to concerns about antisocial behavior. Also, worries about additional maintenance were mitigated, via robust specification and proposed maintenance collaboration.

Final Designs include two options. Option A, 'Planters and Field', has a wildflower field on sloped areas, and a series of planters intended for local shops or groups. The hope is a planter could become a Physic Garden adopted by the Doctor's Surgery, or an Italian herb garden sponsored by the Italian restaurant (see Figures 8 and 9). There could be no leaseholder maintenance cost. Planters have single seats well spaced out, to allow rest for those in need -but not facilitate gathering. Option B, 'Field', includes only the wildflower meadow, addressing concerns regarding seating. It also keeps costs down: there is no capital cost for planters, and no planter maintenance. Planted with robust local plants, the meadow would only require occasional care.



Figure 8. Final Design Options, Option A 'Planters and Field' and Option B 'Field'

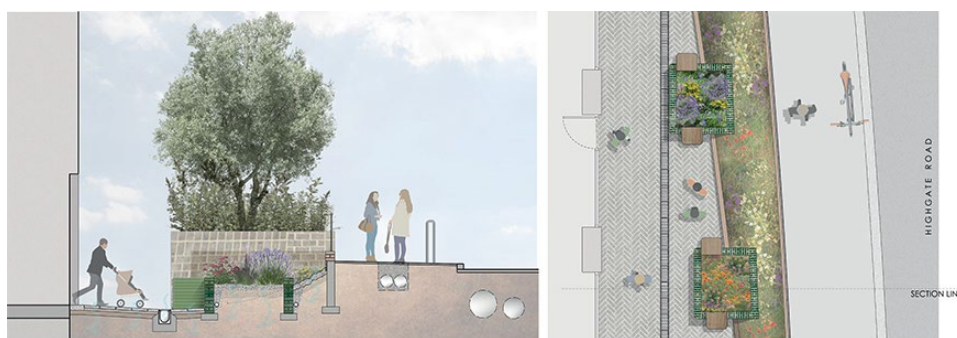


Figure 9. Detail of planter section and plan, Option A

Next Steps

As noted above, Final Design Options were presented at the DPNF AGM, June 2023. The presentation highlighted the process and final results. It included a short summary of May Community Engagement activities, see Figure 10. Feedback findings were reported, indicating a high percent of respondents supporting green improvements, plus their additional suggestions. Next steps stated were forming a working group and investigating fund raising.

A guest speaker at the AGM was the architect of developer Hondo, who presented the Highgate Studios proposals to the Southeast of the site. Minutes of the meeting recorded unrest, "local residents raised concerns about being overlooked by these two proposed buildings."²⁰

In September 2023, it was agreed DPNF would assist "to create a working group with locals and make a forward plan" for Highgate Fold.²¹ However, the team were becoming aware of estate development fatigue. In November, it was reported that "residents [are] not so keen and have other priorities with regards to the building".²² Not only had the TRA been fighting various surrounding developments, there were problems reported with the maintenance of estate buildings.

The team prepared to meet TRA representatives, anticipating an exit interview and to shelve the project. The DPNF wanted to facilitate an improved external space on the shop parade, but needed resident buy-in.



Figure 10. DPNF AGM slide

INTERVIEWS AND ANALYSIS

Questionnaire

To better understand stakeholder positions, a questionnaire was prepared by the author, meeting Ethics requirements of the University of Hertfordshire. Questions were to be a prompt for conversation about the project and process, identify key barriers, and ascertain whether people want it to proceed.

The Questionnaire includes 10 questions, see Table 4. Most are open ended, intended for participants to have freedom to provide their unique views. The exception is question 4, where the first half is closed, eg. yes/no.

Questions have been phrased in different ways to elicit responses in three focus areas: the current design, the process the team followed, and what community members actually want. The last two questions were intended to provide room for further input.

INTERVIEW QUESTIONS		
Question	Conversation Prompts	Focus
1	What do they think of the proposed designs of the shop parade (Highgate Fold).	Current Design
2	Do they have any alternative suggestions?	Current Design
3	What works for them, what doesn't, and why?	Current Design
4	Do they want it to proceed? Why or why not?	Current Design
5	What did they think of the process to date, to get to this design?	Process
6	What could be a better process in future?	Process
7	Is there something else more important or urgent that the design has missed, or that should replace what is proposed in the design?	What is Wanted
8	Has something changed in your viewpoint between the start of the design process and now? Can you explain?	What is Wanted
9	What do they think should happen next?	Allow Further Input
10	Anything else you'd like to add?	Allow Further Input

Table 4. Interview Questions

Interviews

Interview format was face to face, sitting down, with questions to prompt discussion. Final Designs images, Options A and B, were provided as hard copy and on laptop. Question forms were filled in, and the author took notes.

Critical Observations

Despite low numbers, with seven final respondents, overall there was a range of user, see Table 5. Unfortunately, no council tenants or renters responded. However, many participants were part of the TRA so might have relayed on sentiments. The sample may be self-selecting, only including those interested, and positive about the project. Also, those on the list were reached through the DPNF network and via the TRA. This may prejudice the sample towards those interested in community groups and participation. Finally, there is the bias that the author and interviewer has been involved in the project from start, and wishes its success. That all said, the results do give some valuable new insights.

INTERVIEW PARTICIPATION	
Number	Comment
22	Initial contacts on list
7	Participated (+ 1 therapy dog!)
2	Interested but too busy
1	Interested but wouldn't attend at the approved* venues
12	Missing - did not respond to initial, or reminders, via emails or phone
	Participant by User Category (self categorised)
3	Resident - Leaseholder
1	Resident - Freeholder
2	Shop Parade Employee
1	Local Worker (works in vicinity)
	Notes:
	*approval of UH Ethics Committee is required for all off campus venues, approved venues were a local coffee shop, the TRA Hall, or online if any desired.

Table 5. Interview Participation

Results and Surprises

Following the theme and explore approach outlined by the NCVO, data collected was grouped into themes and numbers of mentions, see Table 6.²³ When scrutinized, there are surprises to unpick relating to design and process. They have been classified as positive, negative and neutral. Other answers were expected, repeating prior feedback.

The main unexpected positive result was that all respondents said yes, they wanted the project to proceed. There is the question as to whether this is biased, and only those interested in the project participated. However, if viewed against previous community engagement sessions, there also was a lean toward proceeding with greening. Greening had a positive response, all confirmed they wanted it. A slight majority of respondents wanted the planter and seats, unexpected due to prior seating concerns. Despite fears of antisocial behaviour, it was surprising to find several positive mentions creating Social Space, but responsibly used. In future, the design could evolve along public safety principles, eg. Secured by Design –Police Crime Prevention Initiatives.²⁴

Participation-related mentions were neutral, to needing improvement. It was encouraging to find participants "feel more involved", and enabled. A key to improve would be for a stakeholder group to own the project, and DPNF handover responsibility.

Two areas emerged as needing improvement. The first is Time and Programme. It was surprising that interviewee's thought it was taking too long, as the team thought residents were no longer interested. It implies a need for more resident involvement, so the community is involved in the momentum, not passively waiting.

This links to the second negative point, frequency of Communication was perceived as low. The trend had been DPNF volunteers updating stakeholders. Instead, actively involved stakeholders could be community conduits.

THEMES FROM DATA COLLECTED				
Theme	Times noted	Context	Exemplar quote AND/OR summary of thoughts	Unexpected Pos/ Neut/ Neg resp.
Greening	14	all 7 =yes project should proceed	'...need in area for something green and brightened up the area.' ' As much 'greening' as possible – climbing plants'	Pos
Seating	12	10 con 2 pro	'Don't want to encourage antisocial behaviour'	
Cost	11		finding funding, shops need to operate, how pay for services/ water	
Safety	11	7 environment 4 personal	'noisy due to emergency services and pollution' 'Need pavers to be flat, safe' 'Avoid Rat Alley- ..., so avoid ...mugging'	
Participation	11	7 positive 3 re. future 1 negative	'...makes you feel more involved, giving comments.' 'Feels enabling – DPNF involvement'	Neut
Longevity	8		'IF you area going to do it, do it properly – eg. sturdy/ long lasting.'	
Cleanliness	8		drainage, bins, dogs toilet... 'ongoing work in future to keep up to standard'	
Timeframe/ Programme	7	6 re. past 1 re. future	'...seems quite slow but Covid got in the way! Also realise funding needs to be in place' 'Complication that it is estate'	Neg
Social Space	6		'Encourage positive use'	Pos
Accessibility	6	3 re. less able 3 re. circulation	'...pavement is difficult for wheelchair surface'	
Communication	4		'[want]...more updates generally'	Neg

Table 6. Themes from Data - Summary.

CONCLUSION

So, can Neighbourhood projects progress, in shifting, complex circumstances? The answer is a solid Maybe!

In the process of developing Highgate Fold, the DPNF has been useful for Manoeuvres, as described by Sarah et al., between stakeholders and council. The team assisted with participatory design and negotiating funding. Limitations included knowledge on-the-ground of user views, for example emergence of so-called development fatigue.

It may be appropriate to give the project back to users via a new Quasi Formal Collective, formed of stakeholders. This could grow out of the existing TRA and estate Greening Group, along with keen members of the shop parade -business owners and NHS Surgery. The challenge is commitment, where the trend has been low participation, evidenced by interview take-up. A start may for those who

interviewed to form the core group, and be supported by the DPNF and local Councillors. The new Collective could address concerns with Participation, Time/Programme, and Communication.

Organisation could be as an informal Coop, as Nowysz's description, or Coalition, as Campo's. UA examples may be relevant -though not exactly an urban farm- a shared Social Value, such as Social Greening, could be a key driver. A remit could be to address pollution and increase wellbeing, linking to the onsite NHS social prescription service. A funding possibility may be a market stall, eg. selling Italian herbs.

The community could unite via the medium of Planting (rather than Art). Improved public facing space may increase participation, and facilitate community empowerment and hopefully social cohesion. As per DPNF Minutes of November 2023 'watch this space'.²⁵

NOTES

- ¹ Dartmouth Park Neighbourhood Forum, *Dartmouth Park Neighbourhood Plan* (Adopted 02 March 2020), 133.
- ² "Analysing qualitative data for evaluation", National Council for Voluntary Organisations, Accessed July 21, 2024, <https://www.ncvo.org.uk/help-and-guidance/strategy-and-impact/impact-evaluation/evaluation-and-impact-reporting/how-to-analyse-qualitative-data-for-evaluation/>.
- ³ Rachel Sara et al. "Austerity urbanism: connecting strategies and tactics for participatory placemaking", *CoDesign* (2020): 4, DOI: 10.1080/15710882.2020.1761985.
- ⁴ Sara et al., 4
- ⁵ Sara et al., 19.
- ⁶ Sara et al., 23.
- ⁷ Aleksandra Nowysz, "Modernist Projects of Community-Based Urban Farms in Residential Areas—A Review of Agrarian Cooperatives in the Context of Contemporary Urban Development", *Buildings* (2021), August 20, 2021, <https://doi.org/10.3390/buildings11080369>, 10.
- ⁸ Nowysz, 10.
- ⁹ Nowysz, 8.
- ¹⁰ Nowysz, 11.
- ¹¹ Nowysz, 11.
- ¹² Nowysz, 11.
- ¹³ Pablo de la Cal, "Citizen Participation. Urban Development for and by the People", In *Urban Visions : From Planning Culture to Landscape Urbanism*, ed. Carmen Díez Medina and Javier Monclús, (Cham: Springer International Publishing AG, 2018.), Accessed June 14, 2024. *ProQuest Ebook Central*, <https://ebookcentral.proquest.com/lib/herts/detail.action?docID=5435261>, 170.
- ¹⁴ de la Cal, 170.
- ¹⁵ de la Cal, 170.
- ¹⁶ de la Cal, 173.
- ¹⁷ de la Cal, 173.
- ¹⁸ Daniel Campo, "Iconic eyesores: exploring do-it-yourself preservation and civic improvement at abandoned train stations in Buffalo and Detroit", *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 7:4 (2014): 351-380. DOI: 10.1080/17549175.2014.952322, 376.
- ¹⁹ Campo, 377.
- ²⁰ Dartmouth Park Neighbourhood Forum, "Dartmouth Park Neighbourhood Forum Committee Meeting: Annual General Meeting", (Minutes of meeting for the Dartmouth Park Neighbourhood Forum, Camden, London, June 29, 2023), 1.
- ²¹ Dartmouth Park Neighbourhood Forum, "Dartmouth Park Neighbourhood Forum: Minutes of Meeting", (Minutes of meeting for the Dartmouth Park Neighbourhood Forum, Camden, London, September 16, 2023), 4.
- ²² Dartmouth Park Neighbourhood Forum, "Dartmouth Park Neighbourhood Forum: Minutes of Meeting", (Minutes of meeting for the Dartmouth Park Neighbourhood Forum, Camden, London, November 25, 2023), 4.
- ²³ "Analysing qualitative...", NVCO.
- ²⁴ Police Crime Prevention Initiatives, "Secured by Design: Commercial Guide", Accessed June 24, 2024, <https://www.securedbydesign.com/guidance/design-guides>, 2.
- ²⁵ DPNF, " Dartmouth Park", (Minutes, November 25, 2023), 4.

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LIVED EXPERIENCE OF VISUALLY IMPAIRED PERSONS AND LIVEABLE SPACE

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INTRODUCTION

Liveability is a broad concept that is related to the quality of life. The term 'liveability' has become a catchword across several fields. Additionally, a lot of organisations work towards rating cities in accordance with their own objectives that may not be inclusive for all, including visually impaired people. However, according to Pacione, in order to understand how a city performs, "both the city on the ground and the city in the mind" should be taken into account.¹ To better understand how urban space performs for visually impaired persons, in a multi-method research, visually impaired people, designers, and people who are involved with visually impaired persons' issues in urban space were interviewed in central Melbourne. Comparing the findings reveals that a variety of components affect visually impaired persons' experiences in the city; some are known for designers and planners such as a safe and legible environment that are aimed to be addressed through design, yet a more detailed approach is needed to enhance their experience in urban space.

Visually Impaired Persons

Vision impairment or loss is broadly recognised as a sensory disability that cannot be remedied through conventional methods such as glasses or corrective lenses. The World Health Organisation reports that approximately 253 million individuals worldwide experience some form of visual impairment, with 36 million classified as blind.² In Australia there are 384,000 visually impaired people.³ It is important to explore how visually impaired persons perceive their surroundings without the sense of sight. As Lefebvre stated, "the whole of (social) space proceeds from the body".⁴ Lefebvre also emphasised that understanding the environment is not confined to an individual's perception alone. Both their lived experiences and conception must also be considered in order to obtain a holistic understanding of the surroundings. This approach has been explained in Lefebvre's theory of space.

Lefebvre's Theory of Space

Lefebvre's theory of space, as outlined in *La Production de l'espace* 1974 (The Production of Space, 1991), introduced a triad-space with dialectic relationships. He emphasised the interconnected nature of these moments or formants, stressing that they should not be viewed in isolation but rather as a cohesive whole. The three moments of space outlined by Lefebvre are as follows:

Spatial practice / Perceived space encompasses the physical arrangement of space. This space "embodies a close association, within perceived space, between daily reality (daily routine) and urban

reality (the routes and networks which link up the places set aside for work, 'private' life and leisure)".⁵ The representation of space / Conceived space is the space of architects and planners. It is the place where the criteria for inclusion and exclusion, as well as the distinctions between what is acceptable and unacceptable are shaped.⁶ Representational Spaces / Lived Space is described as the space of experiences and overlays with physical space. It is defined as a place of inhabitants and users. This space is "the dominated - and hence passively experienced-space".⁷ Lefebvre's theory pertains to the concept of space; however, his work involves a high level of abstraction and can be advanced towards more spatial specificity. Therefore, there is a necessity to define urban space and understand how visually impaired persons have been included in urban space studies.

Urban Space and Visually Impaired Persons

Urban is derived from the Latin word "urbanus - 'courteous' ... to be urban or urbane is to show courtesy, to respect difference".⁸ Urban space is a meeting place.⁹ As a result, urban space is where people with different cultures, genders and abilities coexist. Visually impaired persons, due to their lack of vision, experience difficulties while navigating urban spaces. Urban studies have primarily concentrated on addressing wayfinding and access problems in order to find solutions for their issues. Wayfinding is defined as "the process of determining and following a *path* or *route* between an origin and a destination. It is purposive, directed, and motivated activity",¹⁰ however, liveability is a broader concept with a multi-faceted approach. On the other hand, liveability rankings are not inclusive for all including visually impaired persons.

Liveability

The discourse surrounding liveability may shift to liveability that is presented in media often focused on various city rankings. Numerous organisations and indices endeavour to create liveability assessments based on a diverse array of indicators. The liveability rankings appear to be primarily for city-marketing reasons rather than "actual representative assessment of liveability".¹¹ Liveability rankings examine the "standard of living, not the quality of life".¹² Another limitation of these evaluations is their failure to encompass various social groups in their assessments. Liveability indices overlook the reality that individuals possess diverse preferences influenced by factors such as gender, age, and ability resulting in distinct perceptions of what creates a liveable urban environment. This is noteworthy as they do not accurately capture the lived experiences of people with differing abilities. In addition, liveability rankings are not specifically focused on urban life, which is a key factor in understanding how urban space performs. As a result, a comprehensive approach is needed to understand the liveability of urban space for visually impaired persons.

Case Study and Methods

With a population of nearly 5 million people, Metropolitan Melbourne extends across a wide area that reaches beyond a 50 km radius from the central city and has the reputation of being one of the most liveable cities worldwide in the media. Melbourne has been selected as the case study. With a daytime population of more than 1 million, the city centre is characterised by a significant presence of businesses, facilities, and points of interest for visitors. The central city is accessible from the metropolitan area through a variety of public transport modes, including trains, trams, and buses. A number of services for visually impaired persons are located in this area, such as Blind Citizens Australia and Women with Disabilities Victoria. A multi-method approach has been adopted to understand visually impaired persons' experiences. The first activity was interviewing visually impaired persons (n:7) to gain a better understanding of their perception, conception and lived experiences in urban space. Other methods conducted with visually impaired persons, including words game (n:6) to

analyse the value of different spaces, urban elements and social aspects; Walking interview (n:4) and diary recording (n:3). Other interviews were conducted with designers (n:3), and advocates and stakeholders (n:5).

Findings: Designers and Liveability of Urban Space for Visually Impaired Persons

Liveability has been conceptualised by designers as multi-dimensional. As one built environment professional (BEP) expressed, liveability is a system with various factors and cannot be evaluated based on a singular criterion. Designers aim to create urban spaces that are inclusive, allowing individuals with visual impairments to coexist with those who have sight. Consequently, the urban design that contributes to a safe, accessible, and enjoyable environment for their users should also cater to the needs of visually impaired individuals. For instance, from a safety perspective, it is necessary to reduce clutter at the building's edge, facilitating their ability to navigate by following the edges with their white canes. It was also mentioned that when referring to wayfinding and access issues, it is important to highlight the role of colour contrasts and other sensory signals that may assist visually impaired persons in maneuvering through their surroundings. This can extend to providing indicators that reveal the nature of the blocks, such as whether they are residential or commercial, which can provide valuable context. One element that has been brought up as a promising factor was the proliferation of technology in the everyday lives of visually impaired persons, particularly in relation to their navigation within urban environments. For example, technology may have the potential to replace the need for tactile ground indicators at intersections, as well as providing spatial information to support their navigation, as BEP-3 stated: "hopefully, all sorts of augmentation [in technology], in some ways, replace the more basic kinds of elements, like the tactile tiles and using sounds in intersections. ... if we can move into a more sophisticated digital approach". Nevertheless, it is also acknowledged that not everyone, especially the elderly, may be able to adapt to using technology effectively.

It was accepted by the designers that a liveable urban space should go beyond the basic needs, as a designer (BEP-1) asserted: "I think that to be the most liveable city in the world, not only do we have to get the basics right, but we have to find ways of introducing joy and delight on an everyday level". However, in practice it is revealed that the main focus of designers is to deal with access issues which is also a complicated task. In terms of obstructive criteria related to the physical context, it has been acknowledged that the incorporation of all people's needs is complicated as there is only one built environment to cater to the needs of people with differences. Moreover, the limitations imposed by heritage curtail designers' freedom in establishing an accessible environment. The design complexity is heightened by the constructions and the continuous evolution of urban space, presenting a challenge for designers who are unable to reconstruct it. As BEP-2 asserted, "Sometimes, it can be quite challenging, in that sense, to try and adapt a city for different ends because we are not making it from scratch".

The diverse features of vision impairment and the lack of insight into how visually impaired persons perceive their surroundings are emphasised as limitations in understanding vision impairment. One approach that was mentioned was referring to co-design as a possibility to achieve a better design outcome. Through testing the design and gathering feedback from visually impaired persons, it can become feasible to develop spaces that more effectively cater to their needs. It is also a concern how to provide a multi-sensorial environment to support non-vision senses and elevate the sense of pleasure for them. The importance of community feedback from visually impaired persons and finding the best way to communicate with them was emphasised. As BEP-1 stated, "... I think that would be a really interesting place to start ... what is the language of design when it is not visual?".

The sense of community emerged as an important factor impacting urban liveability from a social standpoint. Furthermore, it was highlighted that educating the community is needed to bolster their support for visually impaired persons. In addition to the shared concerns regarding the diversity of

vision impairment, the necessity for cultural and community awareness, and the challenges associated with achieving an inclusive design, advocates and stakeholders also highlight other significant issues. These include insufficient attention to detail and a lack of engagement between designers and users in the design process.

Liveability of Urban Space for Visually Impaired Persons

Urban liveability for visually impaired persons can be understood through three types of relations: physical relations, temporal relations and social relations which are interwoven. In the following parts, the main focus will be on the physical relations.

It was acknowledged by designers, advocates and stakeholders that a clutter free environment and colour contrast are criteria to assist visually impaired persons, who acquire some level of vision, to have a smooth navigation experience. However, in urban space, various bollards of different sizes in grey or silver are commonly found in urban areas. While visually impaired individuals accept the role of bollards in ensuring pedestrian safety, they also express negative perceptions due to these urban elements' physical characteristics by referring to them as their 'biggest enemy' in urban settings. This serves as an illustration of the struggle to achieve an important criterion like safety due to conflicting desires among different people.

In spite of the availability of various apps designed to aid visually impaired persons in navigating their surroundings, it is apparent that they still rely on tactile ground indicators and audible pedestrian signals. The absence of these sensory cues, even at a single intersection, can be quite disorienting. While the sound of people and social life can indicate when to cross the street, they may not always be a reliable reference when absent.

The environment experienced by visually impaired persons encompasses more than just the facilities tailored to their needs. Various non-designed elements can enhance their sensory awareness and shape their experiences. For instance, the existence of an information centre booth as a landmark, the sound of a shop's ventilator, music drifting from a building, and the scent of cafés illustrate how a multi-sensory environment can be created. On the other hand, stationary features on a smaller scale, like drinking fountains, as well as larger areas such as foyers, may remain unknown to them in the absence of sensory indicators. In addition, a variety of urban furniture, such as street signs including the signs drawing on the footpath, that cannot be perceived by visually impaired persons, are ineffective in providing assistance for them.

Despite the heterogeneous nature of visual impairment, the findings reveal that they also share similar perceptions, conceptions and lived experiences towards urban space. For instance, arcades are generally considered favourably due to their atmosphere. Conversely, Federation Square which is considered a significant icon and civic centre of Melbourne¹³ and "a federation of differences"¹⁴ is not a preferred destination for visually impaired persons. One participant expressed, "I really do not touch Federation Square on my own" (VIP-1). The physical configuration of the area, such as being a large area without adequate indicators, having an irregular shape, and the presence of cobblestones, which makes it difficult for cane users to navigate within the area are among the reasons. Noting that this location features tactile ground indicators and contrasting colours surrounding the stairs for enhanced accessibility. Though this square has a striking form, the novelty and diversity of its urban form are in contrast with the navigational desire of visually impaired persons. In line with that, other groups, such as minority ethnic groups, more probably experience the lack of sense of belonging in this square¹⁵. Tourists, despite the visual appreciation of this square, may also feel a sense of discomfort due to the "lack of legibility."¹⁶ In addition, visually impaired people's navigation stands in contrast to urban diversity, and socio-petality between visually impaired and non-visually impaired people through

design elements requires more attention. For instance, the only urban future that identified as a sociopetal element was water fountains located in front of an art gallery in central Melbourne.

Beyond the differences in vision levels, visually impaired persons exhibit a range of strategies for moving through urban settings. For instance, during the walking interviews it was apparent that not every cane user utilises the building edges for guidance, and not all visually impaired people adopt a slow walking pace. In fact, during the walking interviews, one participant was noted to descend the stairs at a faster rate than the researcher. As a result, the general conceptions of using urban space and the stereotype approach towards users can be adjusted.

CONCLUSION

This article aimed to enhance the comprehension of urban space liveability for visually impaired persons by examining their perceived, conceived and lived experiences in relation to the physical environment alongside the perspectives of designers, advocates, and stakeholders. As stated, liveability is a broad concept that encompasses different aspects of life. There are various ranking systems that aim to rank cities based on their own assessment criteria. Analysing these liveability and quality of life rankings indicates that they are not inclusive for people with different abilities. As a result, a more detailed approach is needed to understand how urban liveability for visually impaired persons is situated in urban designers' conception of urban space. Central Melbourne was selected as the case study. The results reveal that for designers, the notion of urban liveability is not defined by a singular criterion; rather, it is influenced by a multitude of factors that contribute to the ability of visually impaired persons to access, utilise, and enjoy the same spaces as those without visual impairments. Offering opportunities for visually impaired persons to be able to actively participate in urban space was another factor that has been brought up by designers. However, in reality, a liveable urban space is mainly confined to physical access and wayfinding issues. This approach has also been highlighted by Fitzsimons that it appears that there are no existing guidelines that mandate designers to "convey the beauty, the surprise, or even discomfort of an architectural space to blind and visually impaired people"¹⁷. Mediating the conflicting desires among different people, even for basic necessities such as safety, is also a compelling factor to reach for.

Tactile ground indicators and audible pedestrian signals as sensorial facilities are important components of the physical environment, but they do not provide a complete solution for comprehending the environment and making a liveable urban space for them. Where design remains insufficient to provide a liveable urban space, the dynamic and multi-sensorial nature of urban space can enhance visually impaired persons experience. Furthermore, urban liveability for visually impaired persons can be analysed through their sense of belonging and attachment to a specific urban form. The level of vision may vary among individuals, but they still can share the same sense of place in some urban spaces with the same typology.

By shifting the focus from stereotypes and disabilities to the abilities and lived experiences of visually impaired individuals, a more insightful understanding can be gained. The other important factor is that neither visually impaired persons nor built environment professionals tend to conceive space as sociofugal and therefore to focus on its potential to perform as a sociopetal space. Becoming aware of this challenge is a key first step. The lesson that can be obtained is to diversify the research agenda which is currently dominated by wayfinding and perceived space.

ACKNOWLEDGMENT

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NOTES

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- ³ "Real People Real Stories Real Impact: Annual Report 2016-2017," Vision Australia, accessed August 08, 2024, [https://www.visionaustralia.org/sites/default/files/docs/default-source/about-us/va-annual-report-2016-17-\(accessible\).pdf?sfvrsn=0](https://www.visionaustralia.org/sites/default/files/docs/default-source/about-us/va-annual-report-2016-17-(accessible).pdf?sfvrsn=0)
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- ¹¹ Anna Kovacs-Györi, "GIS-based Livability Assessment: A Practical Tool, a Promising Solution?" (paper presented in GISTAM: 5th International Conference on Geographical Information Systems Theory, Applications and Management, SCITEPRES, May, 2019). 289.
- ¹² Adam Okulicz-Kozaryn, "City Life: Rankings (Livability) Versus Perceptions (Satisfaction)." *Social Indicators Research* 110 (2013), 437.
- ¹³ Andrew Brown-May, and Norman Day. *Federation Square. South Yarra* (Vic: Hardie GrantBooks, 2003).
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- ¹⁶ Tony Griffin, and Bruce Hayllar, "Urbanism Tourism Precincts and the Experience of Place," in *Marketing of Tourism Experiences*, ed. Noel Scott et al. (London: Routledge, 2010), 29.
- ¹⁷ J. Kent Fitzsimons, "More than access: Overcoming limits in architectural and disability discourse," in *Disability, Space, Architecture: A Reader*, Ed. Jos Boys (London: Routledge, 2017), 93.

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ARCHITECTURAL AND URBAN PROJECTS TO DEFINE NEW SCENARIOS FOR A SUSTAINABLE FUTURE FOR THE CITY OF BUENOS AIRES

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INTRODUCTION

Buenos Aires has been grappling with a profound crisis spanning various dimensions: economic, social, political, and cultural. Over the years, the city's population has continued to swell, with many inhabitants residing in villas, informal urban settlements predominantly comprised of shacks constructed from scavenged materials and waste. These areas, often situated near the city center, embody a profound degradation in living conditions, where residents frequently face a lack of access to essential public services and even the most basic sanitary facilities.¹

The relentless expansion of these uninhabitable living environments underscores an urgent need to rethink contemporary urban living paradigms in a sustainable manner, aimed at improving the quality of life for the inhabitants of Buenos Aires. This critical context serves as the foundation for a university research initiative that aspires to propose alternative scenarios addressing the current dire conditions. The project begins with a re-examination of the history of social housing within the Argentine context, while also considering successful approaches from other Latin American countries.

Complementing this exploration is an analysis of the existing public policies provided by the Ministry of Territorial and Habitat Development. Although these policies present significant opportunities for social and economic advancement, they also reveal considerable challenges. Drawing insights from European experiences, strategies to mitigate these criticalities can be developed. Key proposals involve reimagining public spaces, revitalizing structurally sound buildings, and demolishing uninhabitable structures to pave the way for a more sustainable urban landscape.

This vision includes offering subsidized housing and devising design tools that local governments and policymakers can effectively utilize. The research project is multidisciplinary and operates on multiple scales, bringing together the University of Udine and the University of Morón in Buenos Aires. Through collaborative design methodologies—ranging from intensive workshops to partnerships with municipal authorities—this initiative aims to facilitate a comprehensive regenerative process that redefines architectural practice within the urban context. By fostering innovation and collaboration, the project seeks to generate new scenarios that ultimately enhance the quality of life for all residents of Buenos Aires.

SOCIAL HOUSING IN ARGENTINA: A CRITICAL OVERVIEW

For two decades, Argentina has been grappling with a persistent economic crisis, a situation that has become almost ingrained in the nation's fabric. Unlike other Latin American countries such as Colombia and Chile, which are experiencing a vibrant architectural revival, Argentina seems to have only partially benefited from this trend. The global spotlight on Latin American architecture, which once shone brightly during the era of renowned architects like Oscar Niemeyer, Clorindo Testa, and Luis Barragán, has dimmed somewhat in Argentina.² This decline in architectural prominence has contributed to the ongoing struggles within the urban environment of the country.

With a population of approximately 44.5 million, Argentina is predominantly urbanized. The majority of the population resides in cities, particularly in Buenos Aires, the nation's capital. The metropolitan area of Buenos Aires alone houses over a third of the country's population, yet occupies less than one percent of Argentina's total land area.³ This extreme urban concentration exacerbates issues related to housing, infrastructure, and public services, highlighting the urgent need for comprehensive urban planning. The challenge of social housing in Latin America has gained significant attention over the years, compelling politicians, social scientists, architects, and urban planners to seek solutions to the spread of villas. These urban slums, primarily constructed from discarded materials, differ from the better-known Brazilian favelas in that they develop near city centers rather than on the outskirts. This central location presents unique challenges in terms of integration into the urban fabric, accessibility to services, and community development. A notable effort in addressing social housing in Latin America is the work of the Elemental architecture group, led by Alejandro Aravena. Their approach revolves around the concept of *vivienda incremental* — a basic, expandable housing structure that provides a minimal, livable space from the start, with the potential for future enhancements. Aravena encapsulates this philosophy by asking, "If resources only allow for about forty square meters, instead of viewing it as a small house, why not consider it as half of a good house?"⁴ This statement emphasizes the need for a paradigm shift in thinking about housing solutions, urging designers and policymakers to consider the long-term potential of living spaces.

The Elemental group's work serves as a valuable case study, demonstrating how a design process aimed at improving social housing can scale from individual units to entire city blocks. The principles championed by Aravena could be particularly relevant in Argentina, where a more grassroots, participatory approach might counterbalance public policies that often exclude the very communities they aim to serve. Engaging residents in the design and construction processes could foster a sense of ownership and responsibility, leading to more sustainable and resilient communities.

Looking back at Argentina's own history, the social housing landscape was significantly shaped in the 1970s by the development of *megaconjuntos habitacionales* — vast residential complexes born from collaborations between the government and private entities. As noted by Aldo Rossi, these projects were heavily driven by speculative forces, becoming major contributors to urban growth⁵. However, in Buenos Aires, these sprawling complexes, disconnected from the city's grid and social dynamics, have led to the marginalization of thousands of residents. The isolation experienced by these residents further perpetuates cycles of poverty and social exclusion. Today, one could argue that demolition may be the only viable solution for these complexes, as living conditions within them increasingly resemble the dire situations found in the villas. This raises critical questions about the future of urban policy and social housing strategies in Argentina. Moving forward, a holistic approach that encompasses not only the physical aspects of housing but also the social and economic contexts in which these communities exist is essential. Policymakers and architects must prioritize inclusive practices that empower marginalized populations, ensuring that the narratives of those who inhabit these spaces are central to the dialogue around urban development.

In summary, while Argentina continues to navigate through its economic and social challenges, there lies an opportunity for innovation in architectural practices and urban policy. By learning from both local history and successful initiatives in the region, the potential to develop sustainable and humane living environments for all residents of Buenos Aires remains possible, provided that a cooperative, socially-conscious approach is embraced.

A STRATEGIC URBAN AND ENVIRONMENTAL DEVELOPMENT INITIATIVE

In years, the Argentine Ministry of Territorial Development has taken the lead in implementing a comprehensive set of public policies aimed at transforming the construction sector and addressing the nation's pressing housing challenges. Between 2021 and 2023, several key initiatives have been launched, each anchored in four central pillars designed to foster an inclusive and sustainable housing environment. Firstly, the *Own House* initiative provides citizens with access to credit for the independent construction of new single-family homes. By facilitating financial resources, this program empowers individuals to create personalized living spaces that meet their specific needs and preferences. This aspect of homeownership not only aims to promote the physical well-being of families but also seeks to enhance their emotional and psychological sense of security and ownership. Secondly, the *Procrear* program is focused on fostering the development of new residential neighborhoods. This initiative generates mortgage credits, making it increasingly easier for citizens to purchase newly constructed apartments. By incentivizing the construction of apartments in urban areas, Procrear aims to address the acute shortage of affordable housing and promote social integration through diverse community environments. This initiative reflects the government's commitment to creating not just homes but vibrant neighborhoods that foster community interaction and cohesion. The third pillar, the *National Urban Land Plan*, seeks to develop fully serviced plots of land, enabling citizens to build their own homes with all necessary infrastructure in place. This initiative acknowledges the importance of providing essential services such as water, electricity, and sanitation as foundational elements for any sustainable housing development. By ensuring that citizens have access to these essential amenities, the plan aims to facilitate the creation of functional communities that can thrive in the long term. Lastly, the *Reconstruct Program* targets the revitalization of abandoned buildings, focusing on the recovery and repurposing of existing structures. This initiative not only aims to reduce urban blight but also promotes sustainability by maximizing the use of existing resources and minimizing the environmental impact associated with new construction. By fostering a culture of reuse and rehabilitation, the Reconstruct Program aligns with global trends toward more sustainable urban development practices. Together, these initiatives represent the most extensive social development effort ever undertaken by the Argentine government. This strategic urban and environmental project is designed to integrate both public and private sectors while increasingly involving local communities in shaping new approaches to social housing. Such collaboration is essential, as it allows for the incorporation of local knowledge and cultural context into the housing development process, ultimately leading to outcomes that are more aligned with community needs and aspirations.

However, a closer analysis of these public initiatives reveals several challenges that need addressing. Despite significant investments, obstacles such as bureaucratic inefficiencies, funding limitations, and the need for improved governance can hinder the efficacy of these programs. Additionally, there is a growing concern regarding the adequacy of these initiatives in genuinely addressing the needs of marginalized populations who often experience barriers to accessing services and resources. To tackle these issues and make meaningful advancements in social housing practices, a research project has been proposed. This research aims to contribute innovative solutions, particularly in the design of public spaces and buildings. These areas are now seen as critical arenas for negotiating new social dynamics, fostering the emergence of new communities, and redefining models of citizenship. By focusing on the

interplay between design, community engagement, and social interaction, the research seeks to develop frameworks that allow for more participatory and inclusive approaches to urban development. The goal is to outline a new paradigm for contemporary living that is inclusive, sustainable, and reflective of evolving social needs. This paradigm aims to create environments that facilitate social integration, cultural exchange, and community resilience, ultimately empowering individuals and groups to take an active role in shaping their living conditions. As Argentina continues to navigate the complexities of its social and economic landscape, embracing innovative research and practices in housing development will be crucial to fostering a more equitable and sustainable future for all citizens. Through a collaborative effort that includes government, private sector input, academia, and community participation, the potential for significant positive change in the realm of social housing is not only achievable but imperative for the nation's progress.

THE INTENSIVE WORKSHOP AS A DESIGN RESEARCH METHOD

Building on these initiatives, a research collaboration has been established between the Universidad de Morón's School of Architecture and Design and the University of Udine's Polytechnic Department of Engineering and Architecture. This partnership aims to develop design tools and strategies to better understand the urban and architectural dynamics in Argentina, particularly in Buenos Aires. The goal is to stimulate and guide "ideas for intervention, redevelopment, and modification that can ultimately serve as long-term strategies for the governance of the city and its architecture".⁶

To achieve this, the intensive design workshop methodology was chosen as a key approach. This workshop brought together Italian and Argentine students to collaborate within the physical space of the Universidad de Morón in Buenos Aires. The workshop was guided by faculty, researchers, and tutors from both universities, fostering an environment of cross-cultural exchange and collaborative learning.

As noted by Borrachia,⁷ "These practices, which are frequent in our university, undoubtedly provide moments of collective sharing and growth. They offer not only the exchange of ideas and immersion in other cultures but also the architectural journeys and the interwoven networks that emerge from these experiences, ultimately proposing new directions." The workshop focused on a case study involving the *Procrear-El Palomar project*, a social housing development currently under construction in the Morón municipality, within the urban context of the Autonomous Province of Buenos Aires. This site is adjacent to a green area that has been transformed into a nature reserve undergoing reclamation. The site holds significant potential, especially given the high population density in Buenos Aires and the value of integrating residential spaces with natural environments.

By working on the *Procrear-El Palomar project*, the workshop participants were able to explore the possibilities of creating housing solutions that harmonize with the surrounding green belt. This initiative underscores the importance of designing urban spaces that not only accommodate population density but also preserve and enhance the natural environment, offering residents a higher quality of life.

THE INFLUENCE OF EUROPEAN EXPERIENCES ON SOCIAL HOUSING IN ARGENTINA

Following an initial phase of territorial and urban analysis, the workshop culminated in the creation of a project master plan. This plan, through a series of maps and design drawings, articulated the ideas and hypotheses developed during the workshop. The primary objective was to identify and address the strengths and weaknesses of the case study under consideration. The resulting project seeks to adapt the rigid, top-down approaches often employed by the Argentine government by reinterpreting them through a lens of sustainability. It operates on the premise that "territorial and environmental planning can contribute to social equity by helping to eliminate social divisions and inequalities".⁸

The workshop prompted reflection on how scientific research and architectural design can improve methodologies in Argentina, particularly by drawing on Italy's rich experiences with participatory design. This approach aims to enhance the living conditions of residents, especially within the urban landscape of Buenos Aires.

Beyond the specific project outcomes, the workshop revealed critical insights when comparing European and Argentine design practices. One significant issue identified was the outdated nature of certain Argentine initiatives. The exchange between Italian and Latin American students highlighted the need for a shift toward a new model of participatory architecture—a practice that is not yet widespread in Argentina but could significantly benefit the country.

A key focus of the workshop was the involvement of the local population—the future inhabitants of the spaces being designed. The potential positive impact of such participatory practices on public administration and territorial governance was a central theme. In Argentina, the common practice is to limit design processes to municipal technical offices, even for the architectural design of buildings. These projects are typically handled internally, without external tenders or calls for proposals. This approach restricts the influx of fresh perspectives from architects and urban planners, starkly contrasting with European practices, where public design competitions are often mandatory and bring diverse ideas into the fold. Another innovative aspect discussed was the integration of themes like recovery, reuse, and re-functionalization—core elements of urban regeneration in Europe. These concepts are relatively new and untested in Buenos Aires, where the abundance of available land makes the urgency of global sustainability goals, such as achieving zero net land consumption by 2050, seem less pressing. The Argentine government's development plans largely overlook these sustainability directives, as evidenced by the country's lack of participation in initiatives like World Soil Day.⁹ The workshop's collaborative sessions allowed Argentine participants to engage with and draw inspiration from cutting-edge research projects in Italy. This exposure broadened their understanding of design practices, particularly those involving the introduction of new architectural elements within existing buildings and urban contexts.¹⁰ The exchange not only highlighted the differences between European and Argentine approaches but also underscored the potential for adopting innovative strategies that could reshape the future of urban development and social housing in Argentina.

CONCLUSION

In Argentina many outdated architectural and urban planning practices continue to dominate, standing in stark contrast to the contemporary concepts of urban and territorial regeneration commonly observed in Europe. This persistent adherence to traditional modes of development presents challenges, particularly as society grapples with issues of waste management and resource utilization. In Argentine culture, waste and discarded materials are often viewed negatively, primarily associated with the informal settlements—known as villas—where such materials are employed to construct makeshift homes. This societal stigma complicates efforts to reframe waste and leftover materials as valuable resources that could serve as the foundation for creating high-quality residential buildings.

One potential avenue for advancing subsidized housing in Argentina lies in reversing the current trend that encourages excessive land consumption. The prevailing policy inexplicably favors the construction of new homes on unurbanized land, further depleting the nation's natural resources and exacerbating environmental challenges. Shifting this perspective could prove pivotal in rethinking the future development of Buenos Aires, where urban sprawl threatens to encroach upon vital ecosystems. By placing emphasis on regenerative practices—such as the recovery of abandoned spaces and the innovative reuse of materials—Argentina could implement feasible and desirable strategies for urban development that respect both the environment and the needs of its citizens. In the current conditions,

it is urgent to consider architectural design as a high maintenance process, favouring the modification of the existing.¹¹

In this context, the *Reconstruir* project represents a critical opportunity for reshaping social housing policies in Argentina. Currently, this initiative stands as the only public policy for social housing that prioritizes sustainability by actively avoiding land consumption. By elevating *Reconstruir* from its presently marginal role to a central focus in housing strategies, Argentina could lead the way in demonstrating how effective sustainability measures can be integrated into mainstream urban planning. Simultaneously, there is an urgent need to foster the creation and growth of urban regeneration agencies, which have proven to be invaluable in countries like Italy. These agencies act as essential tools in the realm of social housing architecture, offering practical solutions and facilitating the transformation of urban environments. By engaging with local communities and stakeholders, such agencies can ensure that regeneration efforts are inclusive and responsive to the needs of the public. Furthermore, university research has emerged as a crucial mechanism for driving the development and enhancement of public processes related to territorial and urban regeneration. The exchange of knowledge between academic institutions—despite their varying contexts—has led to meaningful cross-pollination of ideas and best practices. In particular, the involvement of Italian universities has been instrumental in introducing relevant regulations, case studies, and valuable experiences from the European context into Argentina. This international collaboration not only enriches the local academic landscape but also enables Argentina to learn from the successes and failures of its European counterparts. By engaging in this exchange of insights, Argentina can potentially avoid repeating mistakes made in Europe, thus accelerating improvements in public space design processes and urban planning practices. Emphasizing the integration of sustainability practices and adopting forward-thinking strategic visions will be essential for Argentina as it strives to foster a more sustainable and equitable model of urban development. Ultimately, the careful consideration of waste as a resource, coupled with a commitment to regenerative practices and robust academic collaboration, holds the promise of transforming Argentina's urban landscape. By embracing these principles, the nation can pave the way for innovative housing solutions that not only address immediate needs but also contribute to the long-term health and vitality of its urban environments.

NOTES

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OUTDOOR RECREATION SPACE: ACCESSIBILITY AND ASPECTS OF CREATING URBAN RESILIENCE

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INTRODUCTION

Outdoor recreation spaces are pivotal components of healthy neighbourhood design that can foster well-being, community connection, and urban sustainability.¹ The impact of spaces on health can be felt through individual lived experience.² The prevailing literature on healthy places has demonstrated the importance of walkability, including the quality, availability and access to open space on health outcomes.³ Generally, a range of different size and type of open space is provided (e.g., parks, playgrounds, civic spaces, temporary closures of streets) to afford opportunities for people to get outdoors and engage in leisure, social, and recreation activities. Research on outdoor space use has largely focused on a single or some open space (e.g., parks) but seldom on the diversity of outdoor recreation space use patterns. A growing number of studies have demonstrated that these use patterns can vary by user socio-demographics,⁴ times of day and days of the week,⁵ types and intensity of activities,⁶ and types of outdoor recreation space.⁷ Few have studied high-rise, high-density urban setting and population in Asian cities. This paper aims to address these knowledge gaps. Using Singapore as the research setting, our study seeks to develop a comprehensive understanding of the "when, who, where, how, and why" of outdoor recreation space in the context of high-rise, high-density neighbourhoods. We employ a mixed-methods approach that combines a nation-wide community survey (n=1200), walkalong interviews (n=60), and systematic on-site observation across five outdoor recreation space typologies in three key planning areas to delve into the spatial nuances and needs among Singapore's multi-cultural population and discern patterns in outdoor recreation space usage and experiences at the national and planning area levels.

Defining outdoor recreation space

Over the years, an increasing variety of open space and recreation opportunities has been provided in Singapore on ground level and at different heights within buildings for recreational enhancement.⁸ Formal greenspace provisions are extended to public housing where 80% of Singapore's 4 million resident population live.⁹ The goal is to provide 0.8 hectares of green space per 1000 people.¹⁰ By 2021, there is 0.78 hectares per 1000 people, and outdoor recreation space has become an integral part of Singapore's urban environment with a range of typologies (Figure 1).

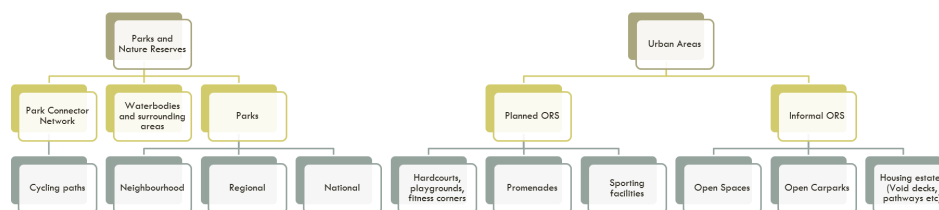


Figure 1. Typologies of Outdoor Recreation Space in Singapore

OUTDOOR RECREATION SPACE AND URBAN RESILIENCE

With the global challenges of rapid urbanization, climate change and COVID-19 pandemic, cities have increasingly included health and wellbeing in urban development through creating healthy spaces (e.g. more greenspace) to enhance liveability and sustainability.¹¹ The World Health Organisation has launched the Healthy Cities programme in 1986, defining a Healthy City as a place that continuously improves both its physical and social environments, enhancing community resources to enable individuals to support each other and achieve their full potential in all aspects of life.¹² From urban planning and environmental psychology perspectives, healthy places can be defined as physical, social, and institutional environments characterized by health-promoting factors that lead to improved behavioural, social, psychological, and biological health.¹³

Environmental health research has highlighted the social and physical environment as a direct factor of health. The negative effects of air pollution on individual health and the positive effects of greenspace on mental health and stress restoration are some of the most well-documented direct impacts of the built environment (BE) on people.¹⁴ Studies have extensively discussed the benefits from access to greenspace and parks: increased level of physical activity, improved self-rated health, and reduced chronic health conditions mediated through increased intensity of physical activity.¹⁵ The perceived proximity to parks has been positively correlated with health-enhancing physical activity among different age groups, including adolescents,¹⁶ adults,¹⁷ and older adults.¹⁸ Having greater access to nearby parks is also associated with a lower risk of various diseases, including cardio-cerebral vascular diseases, joint diseases, and endocrine diseases.¹⁹ Objective proximity to parks is positively correlated with moderate to vigorous physical activity in adults²⁰ and with recreational physical activity in older individuals.²¹

Despite the existing body of evidence supporting the significance of healthy places and greenspace for health, there remains a need for further research to fully understand the mechanisms underlying the connection between place and health through the quantity and types of nature exposure. Very few studies have used a combination of methods and there is also a lack of studies on high-rise high-density urban landscapes²² or how a range of outdoor recreation space are used as part of everyday life space.²³ It is useful to clarify the role of outdoor recreation space in everyday life space given its ubiquitous provision, especially for different socio-economic groups and in diverse cultural contexts, like the densely populated Asian city, which are less well-examined.²⁴

METHODOLOGY

Our study uses mixed-methods research to identify and understand Singapore residents' (and their sub-populations) outdoor recreation needs, preferences, expectations and usage patterns: recording micro-spatial attributes that attract people and their usage patterns. Three of the key methods are covered in this paper—community survey, walkalong interview and systematic observation (Figure 2).

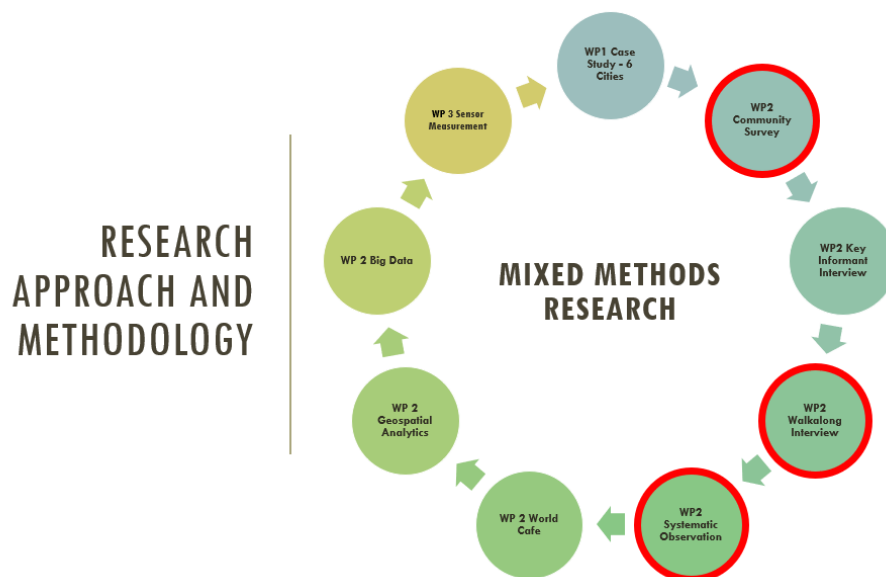


Figure 2. Research Approach and Methodology

Community survey

We conducted a nationwide survey (n=1200) among individuals aged 15 and older in face-to-face household interviews between August 2023 to October 2023, as part of an ongoing national park usage survey. Data collection was managed by a professional survey company using a questionnaire developed by the research team. The questionnaire covered participants' socio-demographic characteristics, self-evaluated health and wellbeing, personal interests, life goals and nature relatedness as well as their visit (or no visit) and usage patterns, such as frequency and duration of visits, time of visits, activities undertaken, modes of transport, and travel time to outdoor recreation space. Participants' motivations and satisfaction levels were assessed, along with their perceptions of outdoor recreation space attributes like environmental quality, desirable features, accessibility, and affordability. Respondents also provided suggestions for improving outdoor recreations space. Post-survey data analysis was based on respondents' socio-demographic information, home, work and learn locations (Figure 3) to establish surmised findings. Methods of analysis included descriptive statistics and cross-tabulations, geospatial analysis (incorporating joins, Euclidean distance, and Space Syntax segment analysis), multivariate analysis (such as T-tests, ANOVA, and factor analysis), and segmentation analysis focusing on behavioural and lifestyle aspects.

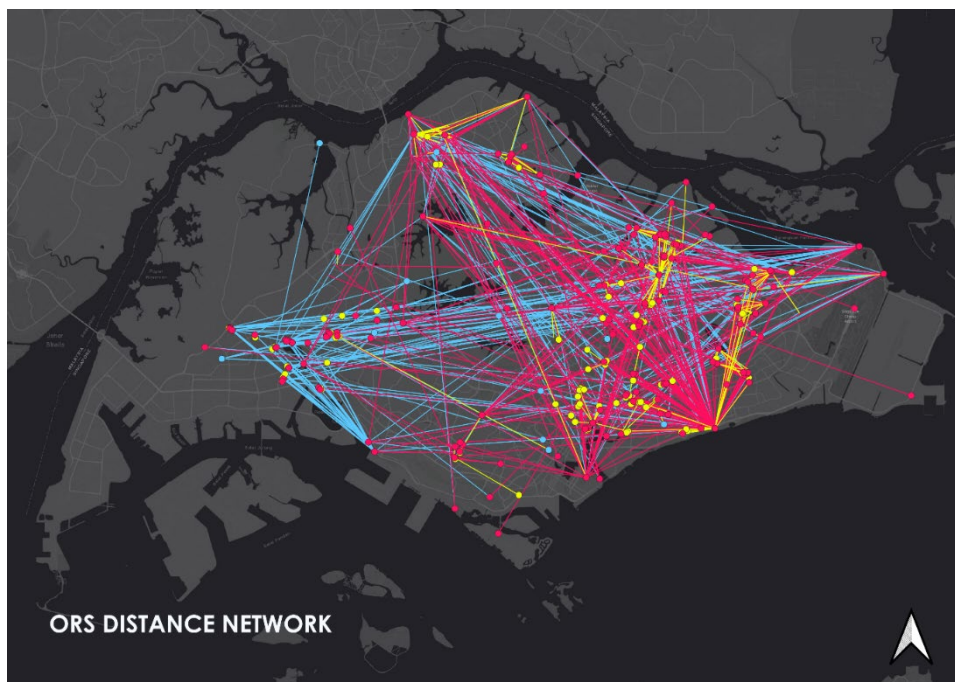


Figure 3. Mapping of Respondents' Origin Destination Patterns

Systematic observation

To systematically observe and evaluate user characteristics and physical activity in outdoor recreation space, we employed the System for Observing Play and Recreation in Communities (SOPARC) method.²⁵ Based on the premise that physical activity and recreation are positively associated with good health, SOPARC collects objective information on users through momentary time sampling within selected sites. Observations were conducted over four days per site (two weekdays and two weekend days) from 7 am to 9 pm, spanning June 2023 to January 2024. Use patterns were collected across various demographics and spatio-temporal conditions, including age groups (children, teenagers, adults, older adults), gender (male, female), ethnicity (Chinese, Malay, Indian, others), social groups (alone, paired, groups of three or more), walking ability (able-bodied, walking aid, wheelchair), weather conditions (sunny, rainy, cloudy/night), and pet presence (yes/no). Findings are analysed through descriptive statistics to summarise demographics and usage patterns, and spatial-temporal usage patterns using heatmaps to analyse activity around specific amenities, such as fitness corners, park connector networks (PCNs), and playgrounds (Figure 4).

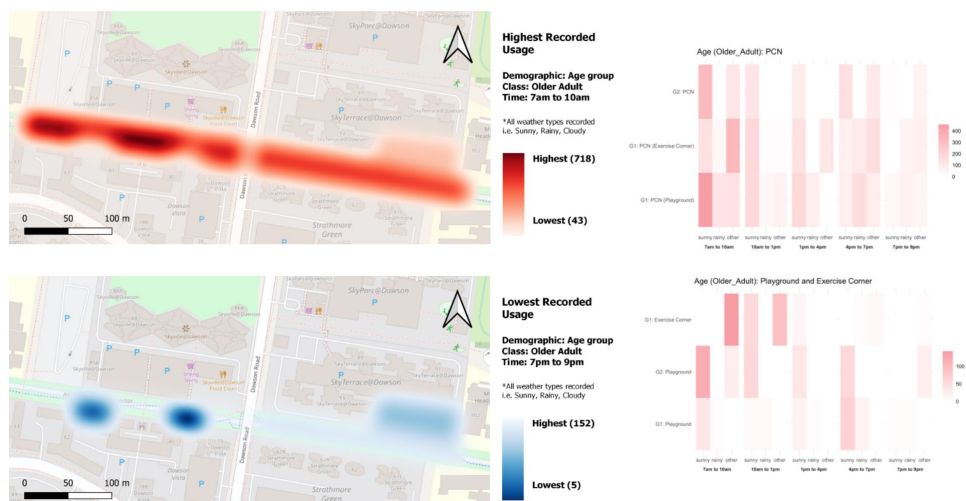


Figure 4. Demonstration of Heatmaps Used in Projecting SOPARC Data

Walkalong interview

The walkalong interview (n=60) explores person-environment relationships by gathering place-based information to understand how different socio-demographic groups access outdoor recreation space and how local environmental factors, such as geographic proximity, perceived accessibility, past use, social conditions, and perceptions influence their experiences.²⁶ These interviews were conducted from August 2023 to February 2024, involving different ages, ethnicity, and gender. Researchers walked with participants, either individually or in small groups of 2-3, to an outdoor recreation space of their choice while asking questions along the way. During these walks, photographs and maps of the routes and spaces were taken where relevant. Data analysis included identifying spatial locations of positive and negative places, landmarks, and travelled routes to assess participants' perceptions and experiences with outdoor recreation space. Methods of analysis included content analysis, including thematic analysis to identify key trends in interview discussions, geospatial analysis to locate key interview landmarks and improvement suggestions, mapping of walk-along routes to identify key pathways in outdoor recreation space, and descriptive analysis of perceived environmental qualities (Figure 5).

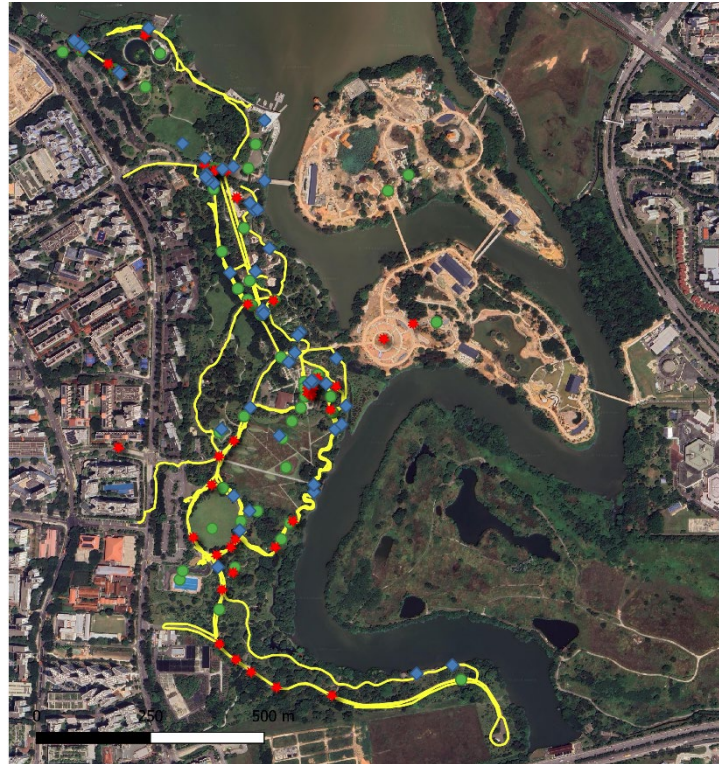


Figure 5. Map Produced from Key Routes and Spatial Features of Walkalong Interview

Locations

We examined 3 study areas and 5 types of commonly found outdoor recreation space in Singapore (Figure 6), which include a Park Connector (linear greenspace), Rooftop Garden, Regional Park, Public Housing Neighbourhood Park, and Private Housing Neighbourhood Park.

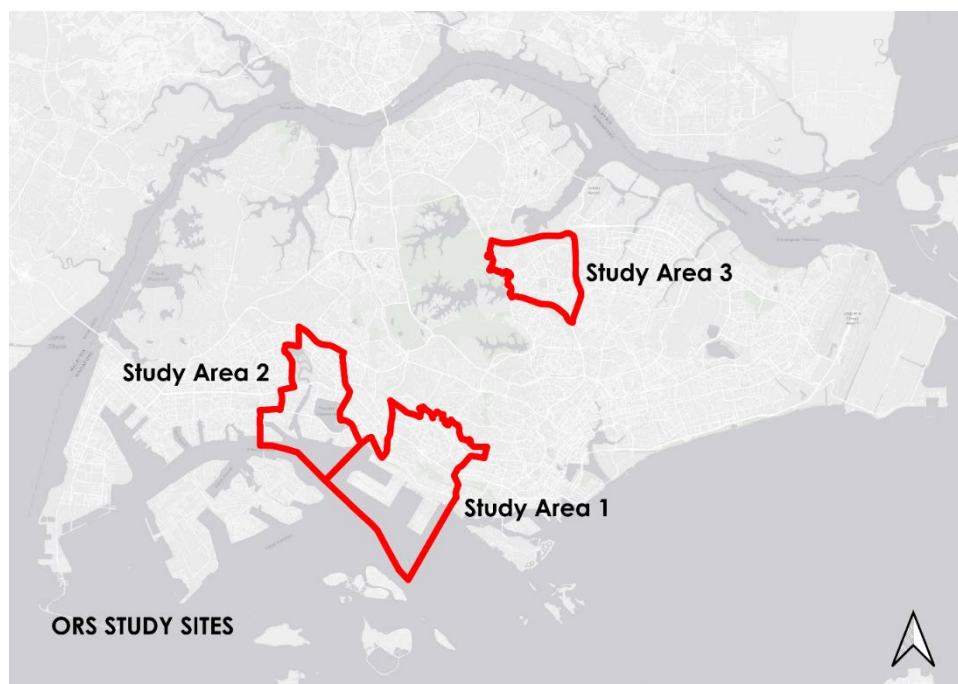


Figure 6. Overview of Study Areas

These typologies canvass a variety of publicly accessible fitness and physical activity options, and in-situ spatial and social programming co-located alongside a range of public facilities. Together, they showcase a spectrum of outdoor recreation space opportunities present in the everyday life of Singapore residents (Figure 7).

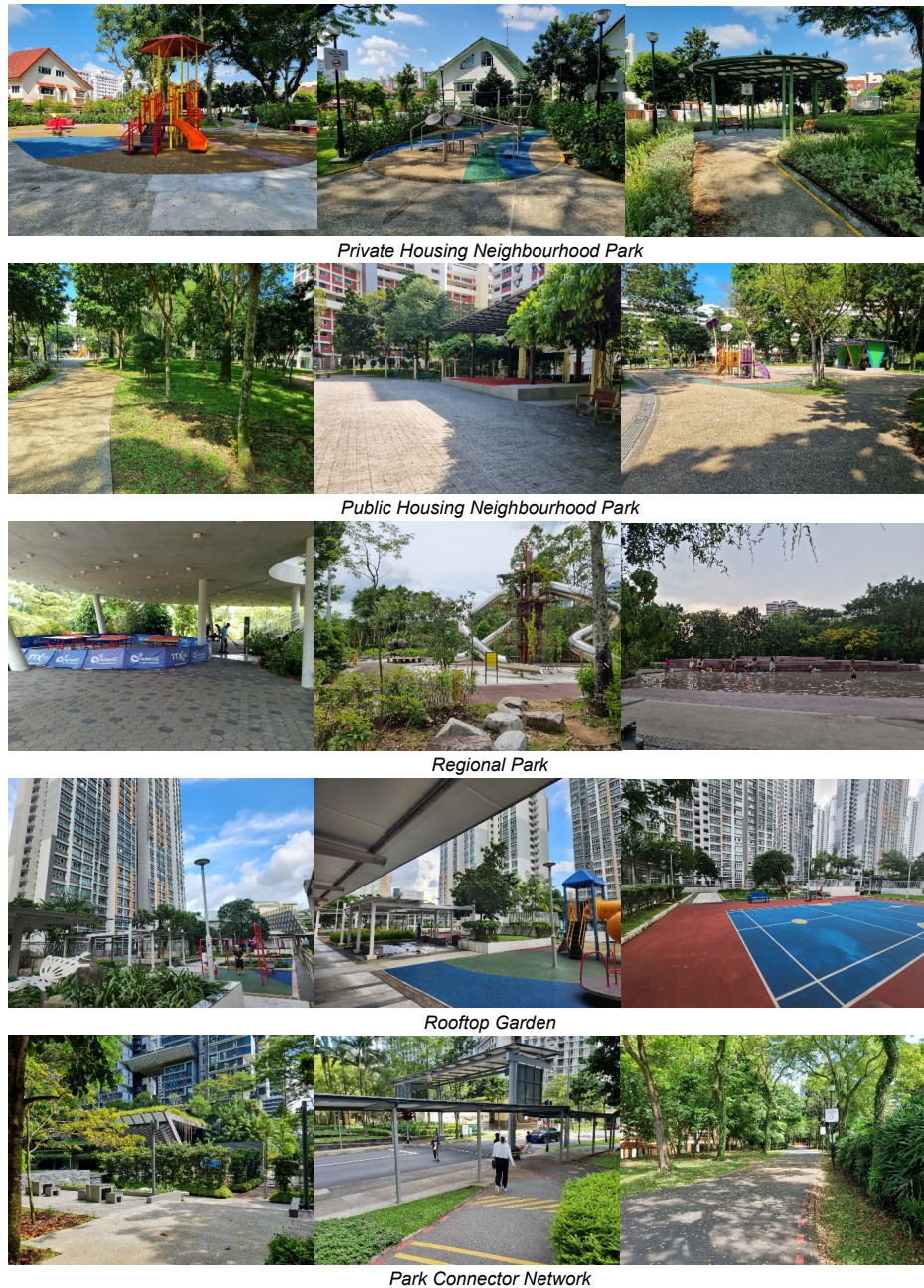


Figure 7. Outdoor Recreation Space Study Sites

Data integration

The summation of this project aims to integrate the datasets from the different methods using the person-environment fit framework (Figure 8). The purpose is to establish an integrative perspective by combining population, individual, and space information to gain a comprehensive understanding of the diversity in people’s use and experiences of outdoor recreation space. The community survey provides

a population level perspective, while the individual perspective is captured through walkalong interviews. From a space perspective, systematic observations give us insights to examine the spatial distribution, location, access, and contextual characteristics of study areas that may affect outdoor recreation opportunities. Efforts were directed at understanding the connections between outdoor recreation activities, motivations, and the physical spaces themselves, with particular focus on the availability and accessibility of outdoor recreation space.

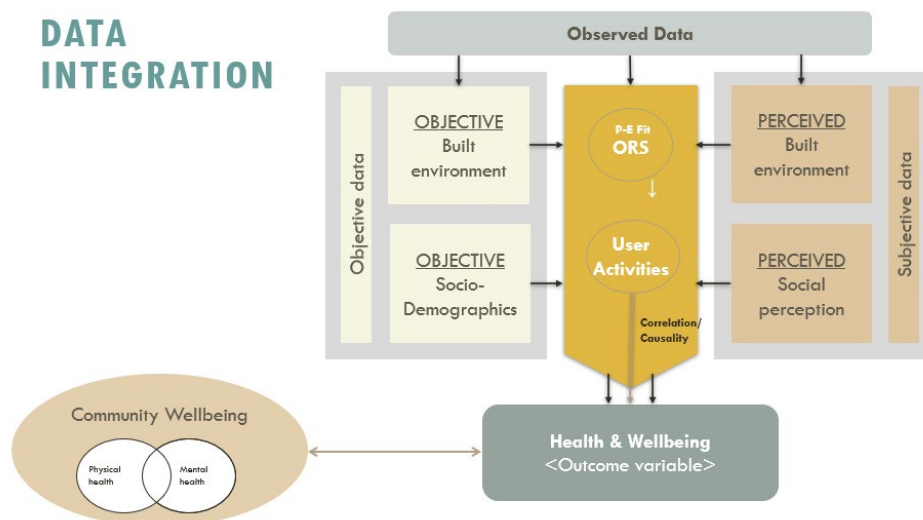


Figure 8. Person-Environment Fit Data Integration Framework

As part of the larger study, we also integrate big data, thick data and other on-site data sources (social media sentiment, on-site weather and user tracking sensors, geospatial datasets). This is combined with our findings of user activities to establish correlational relationships on health and wellbeing outcomes from outdoor recreation space use and perceptions. By layering different methodologies, we aim to form an in-depth understanding of the spatio-temporal patterns of who uses outdoor recreation space, where, when, how, and why (Figure 9).

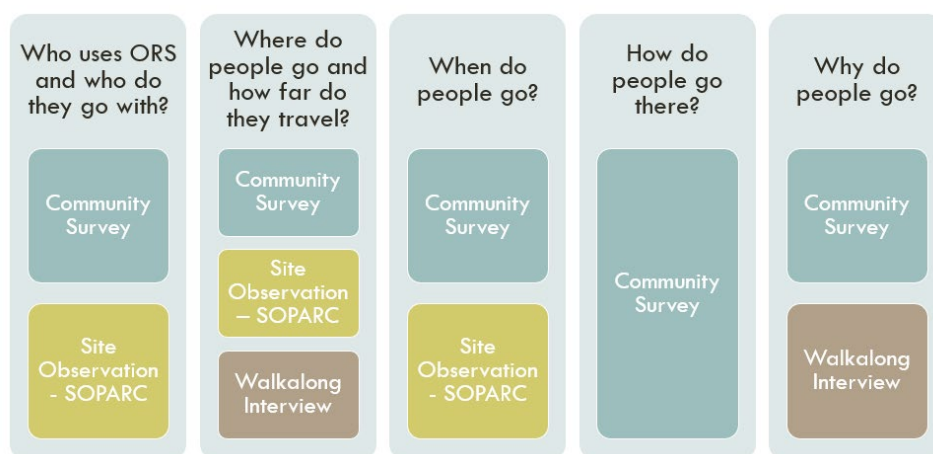


Figure 9. Layering of Methodologies

FINDINGS

Who uses outdoor recreation space and who do they go with?

Outdoor recreation spaces in Singapore are predominantly frequented by older adults, with a notable preference for short travel distance, varying by age and gender. Specifically, individuals aged 60 and above are the most frequent users of outdoor recreation space, with female and those aged 70 and above show a strong tendency to visit their nearby outdoor recreation space the most, often several times a week. More than 60% of older adults aged 60 and above report visiting their favourite or nearby outdoor recreation space a few times a week or more. The size of the social group also influences the spatial usage patterns of these spaces. Those visiting alone typically use outdoor recreation space for functional purposes, such as exercise, travel to public transport, and access to key amenities. In contrast, people visiting in pairs or groups are more likely to engage in social activities, favouring areas, such as playgrounds, water play zones, or spaces with proximate food and other amenities. Understanding the demographics of outdoor recreation space users and their social groups is a path for designing inclusive spaces that cater to different ages and social needs.

When do people go?

Outdoor recreation spaces exhibit distinct temporal usage patterns influenced by various factors, such as climatic conditions and the demographics (age, ethnicity and social groups) of the users. Across all sites, there is a notable spike in outdoor recreation space usage in the morning and again towards the early evening, likely due to the avoidance of strong midday sun. Older adults prefer the early morning, adults favour both early morning and evening, while teenagers and children typically visit after school. Different ethnic groups are observed to have specific temporal preferences, depending on the type of outdoor recreation space—Chinese users are observed to visit outdoor recreation space earlier in the day compared to Malay and Indian users across all sites. Larger social group sizes are observed participating more in programmed activity areas or open spaces. People visiting alone tend to stick to more utilitarian paths, such as the park connector network or fitness facilities.

How do people go there?

Many people (83.6%) are willing to travel up to 60 minutes to outdoor recreation space, with the largest portion (36%) willing to travel between 30 to 60 minutes. Older adults aged 70 and above prefer shorter travel times, with more than 30% of them only willing to spend less than 10 minutes traveling to an outdoor recreation space. Overall travel time is noted to decrease with age. Most people engage in active mobility, such as walking, cycling, or running, to reach their favourite outdoor recreation space, making it the top mode of transport (54.8%). This is closely followed by those who drive or take a private vehicle (28.9%), and those who use public transportation (28.6%).

Why do people go?

People visit outdoor recreations space for a range of reasons, depending on lifestyle and behavioural patterns. From a lifestyle perspective, the analysis yielded two primary groups: active nature lovers (n=661) who seek out outdoor recreation space for physical activity and contact with nature, and the sedentary life supporters (n=539) who may use outdoor recreation space less frequently and for more passive activities (e.g., to sit and watch people/activity in space). Behaviourally, there are four distinct groups: evening active commuters (n=325) who prefer active transportation (e.g. walking) and are the least likely to drive, which may contribute to longer travel durations; active senior morning users (n=370) who prefer the early morning for their activities (e.g. exercise, organised group activity); weekend family outdoors (n=213) who use outdoor recreation space for family gatherings and

recreation activities; and weekend youth socialisers (n=292) who frequent outdoor recreation space for social interactions and leisure activities with peer during weekends.

Where do people go and how far do they travel?

Travel distances to outdoor recreation space are influenced by the accessibility and concentration of services. For nearby outdoor recreation space with average or higher accessibility values within a 500-metre distance, people tend to travel shorter distances, indicating that street network accessibility plays an important role in walkability. When integration levels around home locations are below average, people prefer to travel slightly further for outdoor recreation space with higher concentrations of services. Individuals are also willing to travel greater distances to their favourite outdoor recreation space if these spaces offer higher accessibility and a greater concentration of services within a 500-metre and 1000-metre radius. Accessibility concerns, such as crowding near amenities or poor visibility at night, can influence the choices of users, particularly those requiring walking aids or wheelchairs, who tend to prefer quieter residential areas and facilities.

The most popular outdoor recreation space is East Coast Park (185 ha regional park with a beach and various sports activities, chalets and food destinations), attracting 30% of respondents who travel an average of 7361 metres, indicating its regional appeal. The second most favoured outdoor recreation space is near to home, with 15% of respondents visiting void decks, playgrounds, fitness corners, and hardcourts, reflecting their neighbourhood convenience. The third favourite, Punggol Park (16 ha neighbourhood park with a 5-ha lake), attracts 6.8% of respondents who travel an average of 1918 metres, suggesting its role as a local community hub. Parks are the most frequented type of outdoor recreation space, with those aged 30-44 and those aged 70 and above visiting playgrounds frequently—often observed to be accompanying children or grandchildren. Individuals aged 44 and below, and those aged 70 and above, show a slightly greater preference for beaches. Older adults aged 60 and above often visit their immediate public housing void decks (open space at public housing block ground level), likely due to their limited mobility.

CONCLUSION

Through this project, new information is being collected on micro- and meso-scale place-based lived experience of different socio-demographic groups and the availability and accessibility of outdoor recreation space (e.g., local environmental factors like geographic proximity, perceived space accessibility, past use, social conditions, and perceptions). As data collection is completing, we are working towards combining different methods and data sources, integrating and triangulating three key aspects to inform outdoor recreation space planning—outdoor recreation features and availability (supply), accessibility (demand and preference) and use (spatio-temporal flow).

The findings reveal what Singaporeans care most in outdoor recreation experience and space, how such space is viewed, valued and are being used or not by communities and why. The first is that people visit outdoor recreation space for different purposes at different times, depending on age, personal characteristics and lifestyles. This is consistent with past studies on park usage.²⁷ The second is that people have their favourite outdoor recreation spaces and do not mind travelling further for these places. Several of these favourite spaces are in people's immediate neighbourhoods while others offer a range of activities and spaces, including the attraction of beach and lake. The third is that older adults are the most frequent users of outdoor recreation space. The implication is there is no singular or an average user, and it is important for inclusive space planning to reflect the differing and diverse population needs. A strategy is to design flexible spaces that can be used by different people or same people at different times. Another strategy is to make greater use of proximate places. Proximate outdoor recreation spaces in the residential neighbourhoods are important places in older adults' everyday life

space; older adults are their most frequent users, signalling the relevance of early attention to their needs, which are quite different from other adults due to their age-related decline in mobility, cognition and other sensory ability. Availability, accessibility and amenities present important considerations in when, how, where and why people go to which outdoor recreation space. Social companionship is another cue for greater outdoor recreation space use, especially among families, young people and older adults.

ACKNOWLEDGEMENT

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SECURITY AND ENVIRONMENTAL MANAGEMENT OF MODERN CITIES

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INTRODUCTION

The rapid urbanisation of the global population presents multifaceted challenges and opportunities for city planners and policymakers, as expanding urban areas increasingly strain under the demand for improved services, infrastructure, and environmental sustainability.¹ In this evolving urban landscape, the concept of "smart cities" has emerged as a transformative strategy aimed at enhancing urban management and elevating the quality of life for residents.² These cities integrate advanced information and communication technology (ICT) and various devices connected to the Internet of Things (IoT) network to optimise the efficiency of city operations and services, enabling real-time monitoring and management of critical systems ranging from traffic and transportation to water supply networks and waste management.³ This technological framework supports enhanced data-driven decision-making and increased connectivity, leveraging big data analytics to predict urban needs, streamline resources, and enhance operational efficiency.⁴ Moreover, technologies such as AI, IoT, and cloud computing play pivotal roles in optimising traffic flows based on real-time data, monitoring air quality, and enhancing public health responses, thereby addressing complex security and environmental challenges.⁵ For example, environmental sustainability and security represent crucial concerns within the smart city paradigm, where technological integration enables more effective policing, quicker responses to incidents, and better disaster preparedness while also raising significant concerns about privacy and potential surveillance overreach.⁶ Smart cities approach these environmental challenges by integrating green technologies and sustainable practices into the urban fabric, from smart grids that optimise energy use to intelligent systems for water conservation and waste reduction, thus reducing the environmental footprint of urban centres.

This paper delves into the interconnected roles of environmental management and security in smart cities, highlighting how advancements in one area often bolster improvements in the other. Through a series of global case studies, this analysis showcases effective strategies implemented and potential pitfalls in the implementation of smart city technologies. The subsequent sections provide an in-depth examination of the applications of these technologies in managing urban environments, discussing the implications for urban planners, the challenges posed, and the potential these technologies hold for transforming cities into more liveable, resilient, and sustainable spaces. The paper concludes with a model of smart city management that emphasises a balanced approach to technological integration and human-centric urban design.⁷

ENVIRONMENTAL MANAGEMENT IN SMART CITIES

Smart cities strategically represent an advancement in combining urban sustainability with technological innovation, harnessing information and communication technologies (ICTs) to mitigate environmental impacts and enhance resource efficiency. These cities utilise a network of IoT-enabled infrastructures to monitor environmental conditions in real time, manage energy usage efficiently, and implement proactive measures for resource conservation.⁸ For instance, Copenhagen's integration of renewable energy sources with its district heating system exemplifies how smart technologies can drastically reduce urban carbon footprints and promote energy sustainability.⁹ Similarly, Barcelona's deployment of smart lighting systems that adjust based on real-time environmental data demonstrates the potential for significant energy savings and reductions in light pollution, contributing to both economic and ecological benefits.¹⁰ Furthermore, Melbourne's Urban Forest Strategy leverages sensor technology to optimise water usage and monitor the health of urban greenery, effectively combating urban heat islands and improving air quality, showcasing the multifaceted benefits of smart environmental management systems.¹¹ This paper explores the latest technologies in environmental management for smart cities, their applications, and the locations where these advancements are being practiced.

One significant advancement is the development of advanced sensor networks for real-time environmental monitoring. These sensors are capable of collecting a wide range of data, from air and water quality to noise and radiation levels. For example, the Array of Things (AoT) project in Chicago employs a network of interactive, modular sensor boxes installed around the city to collect real-time data on the urban environment and urban activity.¹² This data is then used to inform policy and planning decisions aimed at improving air quality and reducing urban heat islands. Another notable technology is the integration of green infrastructure through IoT-enabled solutions. In Singapore, the Smart Nation initiative has pioneered the use of such technologies to enhance its urban landscape. IoT-enabled vertical gardens and green roofs are integrated into buildings to aid in temperature regulation and reduce energy consumption. These installations are equipped with sensors that monitor soil moisture and nutrient levels, optimising water use and maintaining plant health, which significantly contributes to urban cooling and air purification.¹³

Additionally, artificial intelligence (AI) and machine learning are becoming integral in managing urban environments. In Tokyo, AI is used to predict and analyse energy consumption patterns within the city. This technology enables the city to manage its electrical grid more efficiently, especially during peak periods, and to integrate renewable energy sources more effectively.¹⁴ AI algorithms analyse data from various sources, including weather patterns and electricity usage rates, to forecast energy demands and adjust supply accordingly. Another emerging tool is blockchain technology, which is being applied to enhance transparency and efficiency in environmental management. In Brooklyn, New York, the Brooklyn Microgrid project uses blockchain to create a decentralised and peer-to-peer electricity trading system among solar energy producers and consumers.¹⁵ This model not only encourages the use of renewable energy but also ensures a more resilient and sustainable urban energy system by allowing residents to buy and sell solar energy without the need for a centralised grid. These examples underscore the dynamic and innovative approaches being taken in various parts of the world to address the environmental challenges faced by modern cities. Some contemporary technologies and practices in smart environmental management are described in the table 1.

Component	Technologies/Practices	Discussion
Waste Management	Smart Waste Bins	Sensors to monitor waste levels and optimise collection routes.
	Recycling and Waste Segregation	Automated systems for sorting and recycling waste to reduce landfill use.
Water Management	Smart Water Meters	Real-time monitoring of water usage to detect leaks and optimise consumption.
	Water Quality Sensors	Safety and quality of drinking water by continuously monitoring parameters like pH, turbidity, and contaminants.
	Rainwater Harvesting Systems	Rainwater management for non-potable uses to reduce the strain on municipal water supplies.
Energy Management	Smart Grids	Efficiency and reliability of electricity distribution through real-time data analytics and demand-response systems.
	Renewable Energy Integration	Solar, wind, and other renewable energy sources to reduce dependency on fossil fuels.
	Energy-efficient Buildings	Green building and technologies such as LED lighting, smart HVAC systems, and insulation
Air Quality Management	Air Quality Sensors	Monitoring pollutants and providing real-time data to inform residents and policymakers.
	Green Spaces	Urban greenery to improve air quality and provide recreational areas for residents.
	Emission Control	Regulations and technologies to reduce emissions from vehicles and industrial sources.
Transportation Management	Public Transit Optimisation	Data analytics to improve the efficiency and accessibility of public transportation systems.
	Electric and Autonomous Vehicles	Use of electric vehicles (EVs) and developing infrastructure for autonomous vehicles to reduce emissions.
	Bicycle and Pedestrian Infrastructure	Bike lanes and pedestrian-friendly pathways to encourage non-motorised transport.
Smart Infrastructure	IoT and Big Data Analytics	Internet of Things (IoT) devices and big data analytics to monitor and manage city infrastructure efficiently.
	Smart Lighting	Adaptive street lighting systems that adjust brightness based on real-time conditions to save energy.
Climate Resilience	Flood Monitoring and Prevention	Sensors and predictive analytics to manage flood risks and implement responsive measures.
	Heat Island Mitigation	Cool roofs, green roofs, and increasing tree cover to reduce urban heat island effects.
Policy and Governance	Sustainable Urban Planning	Policies that promote sustainable development and land use.
	Collaboration and Partnerships	Engaging with stakeholders, including businesses, non-profits, and academic institutions, fostering innovation and best practices.

Table 1. Existing advancements in the environmental management components of a smart city

SECURITY ENHANCEMENTS THROUGH SMART TECHNOLOGIES

Modern cities regularly face a multitude of security challenges, ranging from crime and terrorism to the complexities of managing emergency situations during natural disasters. The dense populations and intricate infrastructures of urban environments demand robust, comprehensive security measures to maintain safety and order. Traditional security systems often fall short, as they typically rely on disparate data sources and delayed responses, proving inadequate against the dynamic nature of urban

threats.¹⁶ To address these issues, cities are increasingly turning to smart technologies that integrate surveillance systems, data platforms, and real-time response capabilities. Surveillance technologies enhanced with artificial intelligence (AI) are now capable of identifying suspicious behaviours and potential threats within large crowds, utilising advanced algorithms for facial recognition and behavioural analysis.¹⁷ Additionally, integrated data platforms play a crucial role by collating and analysing information from a variety of sensors and data points across the city, providing a unified, real-time overview that enables quick, informed decision-making by law enforcement and emergency services.

Case studies from cities like London, Seoul, and New York illustrate the effective deployment of these advanced technologies. London's Metropolitan Police Service uses a real-time crime mapping system that integrates data from public surveillance footage, social media, and police reports to predict potential crime hotspots and optimise the allocation of police resources.¹⁸ In Seoul, a smart policing initiative employs IoT devices to monitor key urban areas, with data fed into an integrated command centre where AI algorithms rapidly assess and respond to incidents.¹⁹ This system also includes a mobile app that allows citizens to directly report emergencies, enhancing community engagement and situational awareness. New York City's Domain Awareness System utilises a network of interconnected sensors and cameras to provide comprehensive, real-time data to the NYPD, aiding in the tracking of suspicious packages, detection of radiation levels, and identification of stolen vehicles.²⁰ However, the deployment of such technologies also raises significant privacy concerns and potential risks of surveillance overreach, underscoring the need for careful consideration of ethical implications and a balanced approach to security enhancements and respect for individual privacy rights.²¹

INFRASTRUCTURE AND TECHNOLOGY INTEGRATION

The successful implementation of smart city solutions hinges on a robust and adaptable technological infrastructure, characterised by the integration of information and communication technology (ICT) with physical urban systems. This integration is foundational for transforming traditional cities into interconnected, efficient, and intelligent urban environments. Central to this infrastructure are advanced data centres, extensive sensor networks, and widespread connectivity options such as fibre optics and 5G networks.²² Furthermore, cloud computing platforms play a critical role by offering scalable and flexible resources that support the storage and analysis of data, thereby facilitating the deployment of applications and services that can dynamically respond to urban needs.²³ This technological backbone is complemented by AI and machine learning systems, which analyse patterns in data to optimise traffic management, energy distribution, and public safety operations, thus enhancing the overall efficacy and responsiveness of urban governance.²⁴

Our case studies have found a strong integration of infrastructure and technology in these advancements. For example, in Barcelona, the implementation of an integrated urban platform manages public lighting, traffic, and environmental monitoring through a centralised dashboard that leverages IoT and cloud technologies. This system not only improves the city's operational efficiency but also reduces energy consumption and carbon emissions. In Singapore, the Smart Nation Sensor Platform integrates sensors and cameras across the city into a unified network that enhances public safety and environmental monitoring, demonstrating the potential of integrated technologies to create a more responsive and sustainable urban ecosystem. Moreover, Amsterdam's Smart City initiative utilises an open and modular digital infrastructure that allows for the seamless integration of new technologies, facilitating innovation and ensuring the system's longevity and adaptability to future needs. However, these advancements also raise significant challenges related to privacy, data security, and the digital divide, underscoring the need to protect citizens' rights in the digital age.²⁵

Therefore, while the technological advancements in infrastructure integration present numerous opportunities for enhancing urban life, they also necessitate careful consideration of governance frameworks to ensure that these innovations benefit all residents equitably and sustainably.²⁶

IMPLEMENTATION AND LEARNING FROM CASE STUDIES

The integration of advanced smart technologies in developing countries often encounters significant gaps due to a range of infrastructural, economic, and institutional challenges.²⁷ One of the primary obstacles is the lack of robust digital infrastructure, which is essential for supporting the data-intensive operations of smart technologies. Many developing countries struggle with inadequate internet connectivity, limited access to technology, and unreliable power supplies, which hinder the implementation of smart city solutions. Additionally, the high cost of deploying advanced technologies and the need for substantial initial investment pose significant barriers, particularly in regions with limited financial resources.²⁸ Institutional challenges, such as bureaucratic inertia, lack of technical expertise, and governance issues, also play a critical role in slowing the adoption of smart technologies. To initiate the integration of smart solutions, developing countries can focus on building digital infrastructure, fostering public-private partnerships, and investing in capacity building and education to nurture local expertise in technology and data management.

To perform an in-depth analysis of the existing literature on smart cities and their security and environmental components, a comprehensive bibliometric review was conducted on 6,152 papers using VOSviewer’s co-occurrence analysis. This review revealed that the literature on smart cities is closely associated with advanced communication technologies, user-friendly approaches, IoT, cyber integration, and other related themes. The co-occurrence visualisation of these findings, which highlights the interconnectedness of these themes, is presented in the figure 1. This analysis can be used to understand the trends of smart city research and implementation worldwide, as well as serve as a reference for future research in this domain.

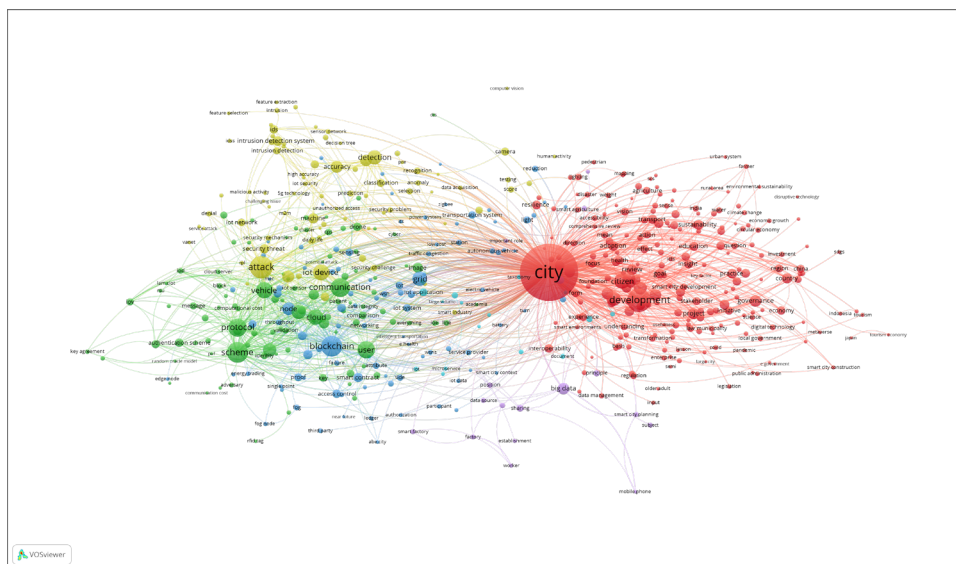


Figure 1. Bibliometric analysis of keyword occurrences in the Smart City research globally

Based on recent advancements in smart city research, several key technologies have been identified and associated with specific countries, which have been taken as case studies. The findings from these case studies are detailed in table 2. The table provides an in-depth look at the key technologies adopted,

along with an analytical discussion of smart city strategies, focusing on their specific objectives, implementations, and challenges.

City	Key Technologies Adapted
Amsterdam	Renewable energy systems, smart grid, IoT sensors for environmental monitoring, urban data platforms, smart mobility solutions
Barcelona	IoT, urban platforms for data integration, smart lighting, smart traffic systems, environmental sensors, open data initiatives
London	Digital kiosks, integrated transportation management systems, open data platforms, smart waste management, adaptive street lighting
PlanIT Valley	Urban Operating System, sensors for real-time data processing, applications for city system management, AI-driven urban planning tools
Stockholm	Environmental monitoring technologies, information technologies across public infrastructure, smart waste systems, renewable energy projects
Cyberjaya	Broadband infrastructure, ICT for multimedia, smart city applications like e-government services, smart healthcare, smart education systems
Singapore	Extensive use of digital media, IoT in healthcare, smart transport systems, AI for urban planning, blockchain for secure transactions
King Abdullah Masdar	High-speed broadband, Integrated Operation Centers for city management, smart logistics, automated industrial systems
Masdar	Sustainable urban design, clean technology and renewable energy, automated transport systems, energy-efficient buildings
Skolkovo	Collaboration platforms for industry and academia, focus on ICT, biomedical, and energy efficiency technologies, smart research facilities
Songdo	Extensive IoT integration, green buildings, smart utilities management, automated waste collection, telemedicine systems
Chicago	Open data initiatives, smart community projects, integration of civic technology, smart energy grids, real-time crime mapping
New York	Open government data, digital engagement platforms, focus on technology sector growth, smart public services, cybersecurity measures
Rio de Janeiro	Emergency Response System, integrated city operations center, IoT for public safety and city management, disaster response technologies

Table 2. Case studies on recently adapted technologies for smart city development

Konza City, known as Africa's Silicon Savannah, is a flagship project in Kenya aimed at fostering technology-driven economic growth. Located 60 kilometres from Nairobi, Konza integrates advanced ICT infrastructure with sustainable urban planning to enhance urban life quality.²⁹ The city relies on a high-speed broadband network, renewable energy sources, and smart building technologies to emphasise energy efficiency and environmental sustainability. Konza seeks to attract international investment and support local tech startups, benefiting sectors such as education, healthcare, and agriculture through technological innovation. However, challenges such as financial constraints, land acquisition issues, and disputes with local communities highlight the need for better stakeholder engagement and transparent governance. In contrast, Nairobi's approach focuses on integrating smart technologies into urban management and security systems. The city has implemented CCTV surveillance systems in key areas, integrated with mobile technology and real-time data processing to enhance public safety and improve response times.³⁰ Additionally, Nairobi has introduced intelligent traffic management systems using sensors and real-time data analytics to optimise traffic flow and reduce congestion.

CHALLENGES AND FUTURE PROSPECTS

Implementing smart city technologies also presents significant challenges, including cybersecurity threats and technological dependencies. As cities become more interconnected, they are increasingly vulnerable to cyberattacks, necessitating robust cybersecurity measures to protect sensitive data and critical infrastructure. Technological dependencies also pose risks; reliance on specific technologies can lead to vulnerabilities if these systems become obsolete or fail. Additionally, data availability and management are critical challenges. Smart city initiatives rely on vast amounts of data from IoT devices, sensors, and citizen interactions. Ensuring data quality, privacy, and accessibility while avoiding data silos is essential for effective decision-making and operational efficiency. Cities must balance the benefits of data-driven solutions with the need to protect individual privacy and maintain public trust. Looking ahead, the development of smart cities will be shaped by emerging technologies and evolving policies. Artificial intelligence (AI) and machine learning will enhance urban management through predictive analytics and autonomous decision-making, optimising traffic flow, energy management, and public safety. The expansion of the Internet of Things (IoT) will improve resource management and service delivery, necessitating better cybersecurity. Blockchain technology offers secure data transactions and transparent governance, streamlining processes and reducing administrative burdens. Policy adaptation will be crucial, with flexible regulatory frameworks and public-private collaboration driving innovation. Integrating environmental sustainability goals will be essential, with smart grids, renewable energy solutions, and advanced water management systems reducing urban environmental footprints and enhancing climate resilience. Despite challenges, the future prospects for smart city technologies are promising. By addressing cybersecurity, technological dependencies, and data management issues, and leveraging emerging technologies and adaptive policies, cities can create efficient, sustainable, and resilient urban environments.

NOTES

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THE MODULOR OF THE FUTURE SUSTAINABLE SOCIETY: EXPLORING HUMAN FIT WITH THE BUILT ENVIRONMENT

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INTRODUCTION

Along with other Nordic countries, Sweden has obtained a worldwide acknowledgement during the second half of the 21st century as a country concretely working for better living conditions for people with disabilities through social entitlements and minimum requirements concerning accessibility and usability to ensure fundamental spatial qualities of the built environment. As a member of the European Union, Sweden engages in the work of introducing the EU directive on accessibility in public services, consequently, also participating in the development of the harmonized European standard EN17210.¹ The European Accessibility Act² is a landmark EU law which requires everyday products and services to be accessible for persons with disabilities. It follows a commitment to accessibility made by the EU with Member States upon ratifying the United Nations Convention on the Rights of Persons with Disabilities.³

Consequently, the Swedish building act stipulates that buildings and physical planning shall be accessible and usable for people with disabilities to the largest extent possible. However, since 2011, the national building industry considers the appurtenant building regulations to be cost generating and blocking the production of new dwellings to overcome the increasingly larger housing shortage. In 2018, the Swedish government mandated the national Board for Building and Planning to draft new regulations to be introduced on July 1st, 2025. The new regulations have met a massive critic from the building industry, but also the municipalities that supervise the compliance with regulations. The regulations are deemed as vague and void of practical information. Suddenly, the contemporaneous discussion about accessibility and usability of the built environment are changed from being fundamental components for creating an inclusive society into becoming negotiable objectives that are related to comprehensive building costs and sustainable building. How come that in Sweden, the most essential concepts of the 20th century's for upholding a user-related perspective on architectural design have become a faint echo of what they used to be?

Technical requirements rather than human needs for the built environment

The Swedish building legislation relies on a legal system, the Planning and Building Act (PBL),⁴ which describes comprehensive functional requirements to fulfill in the architectural design. In Sweden, the Parliament (in Swedish Riksdagen) ratifies the law, but complementary ordonnances can be issued by the Swedish government to clarify the legal intent. Building regulations supply further detailed information. EU directives also influence the building regulations, e.g., requirements for construction,

fire safety and elevators. The 290 municipal administrations for building matters monitor the compliance with the legal requirements. The counties, i.e., the regional level of Swedish civil administration, can confirm or refute municipal decisions concerning physical planning, building permits and notifications. Players affected by a municipal decision on building matters have the right to appeal municipal decisions, which then becomes a legal matter to contemplate for higher courts.

A recent Swedish research study into the meaning and understanding of the concepts of accessibility and usability suggests that the concepts are strongly associated with a series of technical requirements that the national building legislation highlights as essential for creating an inclusive design.⁵ These requirements have developed during the second half of the 20th century. They refer to the maneuverability of wheelchairs in the built space thus highlighting minimum clear widths of corridors, doorways or other passages, minimum gradients for ramps, and the presence of elevators to overcome differences in levels. In addition, the regulations have recommended minimum measurements for hygiene space. However, the previous direct connection between the fit with everyday users and the architectural design allowing for various usages of the built space is less obvious. The research study revealed that respondents declined participating under the pretext that they were not trained architects or engineers. They claimed that only this group of professionals could give valid answers to questions concerning accessibility and usability of the built environment.

Accessibility and usability equal sustainability, or vice versa?

Informants in the previously mentioned study suggested that a combination of an accessible architectural design perspective with a user-focused perspective is beneficial for forwarding user-related demands of the built environment. For countries with an ageing population, forwarding usability would emphasize the need for an architectural design that work in an existential life course perspective thus highlighting scenarios of different usages of the built space in relation to changing needs of the residents.⁶ The concepts of accessibility and usability are mentioned as important criteria in four of the seventeen UN sustainability development goals (SDG), e.g., SDG 5, SDG 10, SDG 11 and SDG 16.⁷ However, the linkage between the concepts of accessibility and usability and the concept of sustainability is vague. It is mainly the Nordic countries that have associated accessibility with usability following the signing the convention. It was a way to merge the existing more detailed and technically oriented concept of accessibility with the user-oriented concept of usability, thus creating a twin concept in the building act.

The seventeen UN SDGs are clearly focused on sustainability as the key criterion to respect for the future built environment, stretching from maximising the use of the building's footprint on the ground to specific selections of architectural forms, constructions, and materials for climate reasons.⁸ The building industry promotes a type of sustainable design that relies on multi-storey buildings with a condensed space that is meticulously adjusted to perceived average square meters for human needs. From a user perspective, the design often suggests an adult human body top physically shaped with perfect health, perfect proportions, and equipped with cognitive brio to overcome both spatial challenges of the envisioned architecture and the effects of a changing climate. Yet, does this focus of sustainability automatically improve accessibility and usability for all?

THE HUMAN BODY IN ARCHITECTURAL DESIGN THINKING

The bimillennial western tradition in architecture emphasizes three essential criteria for evaluating the appropriateness of the architectural design for future users as well as intended usages, i.e., stability, commodity and beauty (firmistas, utilitas and venustas).⁹ The first and the third criteria can easily be explained. The first criterion evaluates the building's need of maintenance and perceivable life span, while the third one has an ephemeral character due to shifting cultural preferences of what is perceived

as aesthetical pleasing over time. The second criterion is perhaps the most difficult criterion to assess, since it is dependent on several decisive parameters – culture, habits and not at least biometrical data – for evaluating the building’s performative capability according to human needs.¹⁰ This assessment criterion must consider the spatial imprint of the human body both in motion and in rest when conceiving the architectural design. It describes the three-dimensional void between the floor and the ceiling to define a height, but also the required width between walls. Together, they describe the space that the architectural design defines around the human body.

Both classical and modernistic architecture considers the human body as a spatial entity. Classical architecture uses an *anthropocentric approach* in which the ideal representation of the human body is closely linked to sculpturing, e.g., Leonardo da Vinci’s illustration of the Vitruvian man. Depth, length and width should proportionally describe a geometrical *sectio aurea* (golden section) between the integral parts of the full building element.¹¹ The ratio derives from the idea that human existence on earth reflects an ideal and divine world that produces measurements for the built space to respect. Modernistic architecture, on the other hand, describes an *anthropogenic approach* in which the human body is paralleled with a three-dimensional apparatus with a specific physical reach due to the length of the body’s extremities, e.g., Le Corbusier’s the Modulor man.¹² While classical architecture produces approximate measurements based on a mathematical formula for human proportions, modernistic architecture¹³ promotes minimum requirements based upon biometrical results from censuses of patterns in populations. Average calculations produce threshold values that will fit most human beings but excluding people in the beginning or at the end of the ranged values.

The modern accessibility and usability requirements aim at overcoming both the anthropocentric and anthropogenic approaches by using seven principles for a universal design that include a large variety of individuals in the architectural design. These principles refer to conditions for equitable use, flexibility in use, simplicity and intuition in use, tolerance for error, perceivable for clues and information, low physical effort and spatial proportions for approach and use.¹⁴

ACCESSIBILITY ORIGINATING FROM THE SWEDISH ‘FOLKHEMMET’

In Sweden, the anthropogenic approach in architecture took over the classical anthropocentric architecture with the opening of the Stockholm Exposition in 1930. Consequently, the internationally acclaimed classical architectural style inspired by national 18th century architecture, the so-called Swedish Grace, met its end. The exposition presented detached houses in premanufactured wooden constructions possible to visit.¹⁵ The vacation house was invented in white-painted wooden façades with green windows and framing. The exposition presented innovative residential solutions based on user needs with new furniture in slender materials and ergonomic-friendly shapes.¹⁶ The exposition emphasized the credo of the time: air and light. Coinciding with political changes, the new functionalistic architecture became the socio-political instrument for the transition from the industrial society towards the egalitarian Swedish welfare state, i.e., the *Folkhemmet* with access to social entitlements like health care, health or unemployment insurances.¹⁷

The exposition prepared for several initiatives about different types of housing and furniture organized by the national association for Swedish architects and the non-profit association for the support of Swedish artefacts and design (see Figure 1).¹⁸ In 1939, the associations created a national research project on physical requirements for the appropriate modern habitat. During WWII, the project defined minimum measurements for modern housing that preceded national building regulations.¹⁹ The programming factor for the modern habitat was the needs of a four-person household with two adults and two children. In 1943, the national association for people with various disability problems joined the project so that the physical requirements would work even for a person using a wheelchair or a person with visual problems.²⁰ The project also attracted the interest from the building industry that had

a keen eye for developing national standards for various building elements, e.g., standards for kitchen cabinets and storage, and a building typology that could be used for precise financial calculations. Parallel to this initiative, a parliamentary committee scrutinized poor housing conditions and conceived a mortgage system that made use of the minimum requirements.²¹

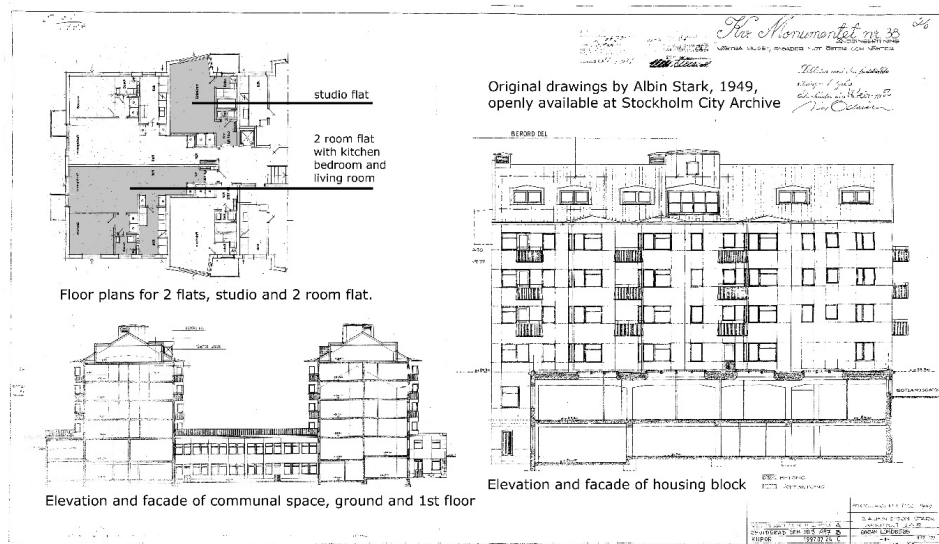


Figure 1. Architectural drawings by Albin Stark for a new housing for people with visual impairments in central Stockholm. The architect Albin Stark adjusted the architectural design to the tenants' needs by creating tactile clues in stairwells and individual flats. The buildings are still in use, but during later refurbishments, these clues have been unintentionally removed [no scale, © author].

Requirements concerning accessibility and usability.

Living conditions for people with disabilities became an urgent matter after WWII given the many casualties and injuries that the war had inflicted upon civilians or members of the fighting forces.²² The matter also revealed prejudices and negative views on people with disabilities that influenced society at that time, but probably lingers on even today.²³ Like nowadays, the main obstacles for an inclusive integration in the surrounding society was linked to the design and realization of the built environment. During the 1960s and 1970s, this new focus on a correlation between the architectural design and users with different abilities resulted in the development of new or reformed building acts in countries like Sweden, Denmark, France, Germany, Italy, Finland, or Norway.²⁴ In other countries, like the UK and the US, the same intention was met by introducing requirements for the built environment to respect in discrimination acts. Programming the built environment became the most essential instrument for removing obstacles for inclusion and promoting opportunities for participation for people with disabilities, see Figure 2.

In Sweden, the high number of older people made appropriate housing for older people and eldercare into an important issue for architects to solve.²⁵ A national architecture competition was organized in 1948 – 1949 to renew existing prototypes for what was then called old people's homes.¹⁹ During the 1950s, research on appropriate housing continued to define functional requirements for the design of modern functions like bathrooms, kitchens and storage. Full-scale adaptations to disabilities were explored, mainly for locomotory problems or visual impairments. The results were so successful that state grants for home adaptations for older people were introduced in 1959.²⁶ The principle of ageing at home, ageing in place, stopped the expansion of new types of old people's homes in Sweden. A program

on national radio caused a public indignation with the state-run institutions for young people with disabilities and opened for dismantling these institutions. During the 1960s, Sweden introduced the normalization principle to include people with disabilities.²⁷

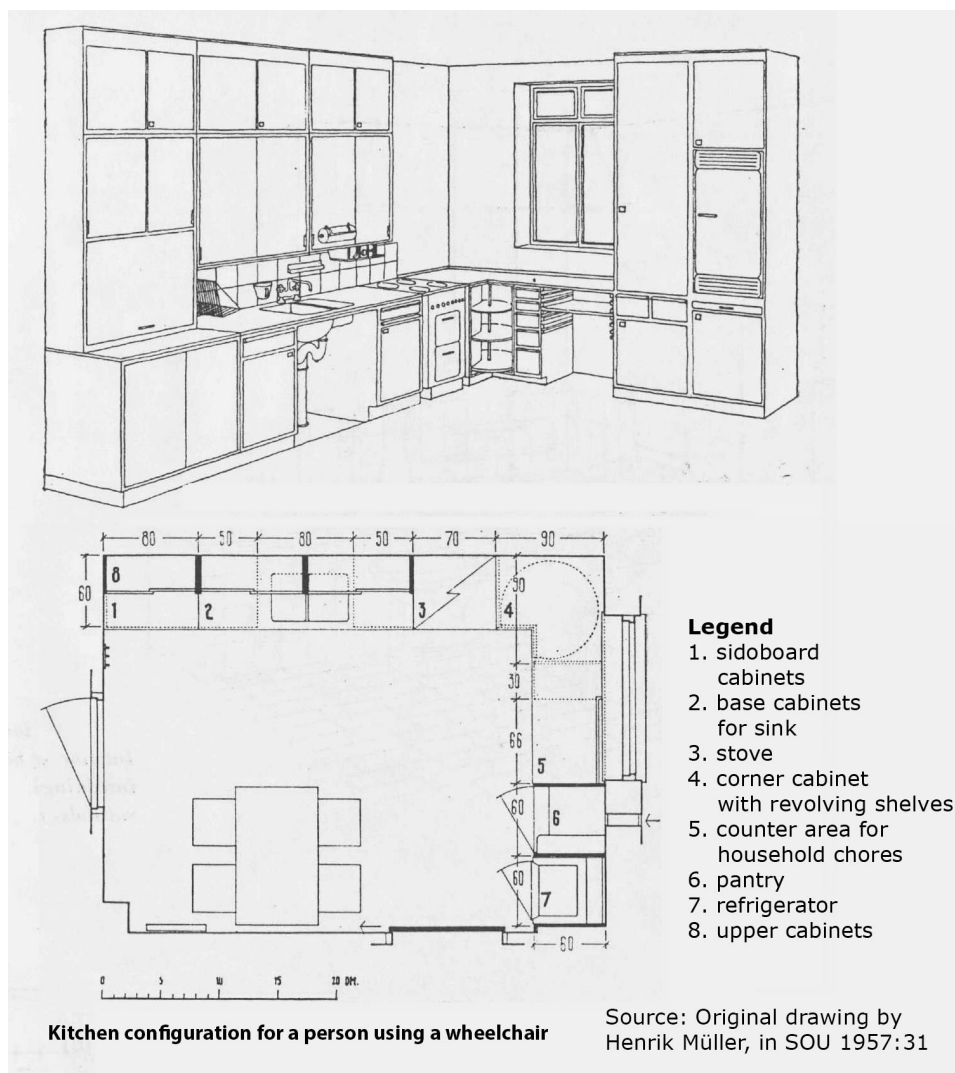


Figure 2. Design of kitchen cabinets and spatial layout for a kitchen adapted to the needs of people who use wheelchairs.²⁸ Architectural drawing from a public inquiry on appropriate housing for older persons and people with disabilities (© author).

Physical requirements for an accessible architecture were developed through full-scale try-outs at the national technical universities. The research engaged students without disability problems as test persons while minimum measurements were registered. Private initiatives organized architectural competitions and invited architecture students to participate with proposals of appropriate residential solutions for people with disabilities, see Figure 3. The national building legislation started to implement physical requirements for accessibility in public buildings in 1963, targeting people who used wheelchairs or persons with visual impairments.²⁹ In 1975, accessibility requirements for residential buildings and housing were introduced, although not on a complete level, since three-storey housing were exempted from installing elevators.³⁰ Furthermore, the intended group for an accessible and usable environment were extended to also include people with cognitive impairments.

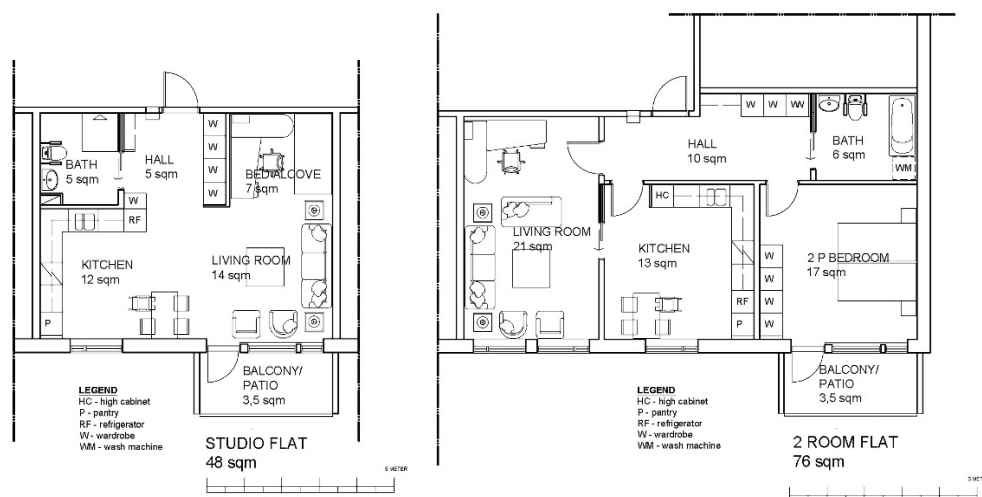


Figure 3. Floor plans for a 1-person flat and a 2-person flat for people with mainly locomotory problems designed according to building regulations from 1975 [no scale, © author].

MANDATORY REQUIREMENTS SUBSTITUTED BY FUNCTIONAL REQUIREMENTS

The new accessibility requirements for public buildings and residential architecture were added as building regulations to an existing and older building act of 1959. The requirements were mandatory, and the implementation was closely controlled by municipal building permits and a system with housing mortgages. In the construction of the Swedish welfare state from 1975, accessibility requirements were undisputable for architects, builders, developers and property owners. They had to meticulously adapt their building projects according to the building regulations. Furthermore, the counties and the municipalities also controlled long-term physical planning, which superseded private property development, so that even regular maintenance work to private buildings were hindered. Real estate owners and the building industry started to question the legal framework for building. A parliamentary commission was formed in 1968 to investigate the need for a new building act. The parliamentary report proposed a new legislation with less mandatory requirements and a transferred responsibility to developers and real estate owners. During the 1980s, the Swedish parliament oversaw the new building legislation and the new so-called PBL system (Planning and Building Legislation) was introduced in 1987.³¹

The PBL with appurtenant regulations defined the responsibility for an appropriate minimum quality of the built space between a developing player and a supervising player. Previously mandatory requirements were converted into functional requirements possible to meet with various architectural and technical solutions. Developers oversaw the integration of functional requirements in the architectural design, while the municipal administrations for building matters monitored the suggested solutions so that they were in line with the PBL system. The municipal building inspectors were replaced by so-called quality experts, commissioned by the developer, who vouched for the full compliance with the requirements of the PBL. To maintain accessibility as requirements for building, the national non-profit association for assistive technology received means for assembling a publication with architectural drawings, illustrations and textual descriptions that explained intentions with existing requirements for accessibility. The publication gave practical advises on how to reach the intended requirements of the PBL. Over time, this publication has become the optimal instrument for safeguarding accessibility in the Swedish built environment. It has become the main source of knowledge about the accessibility and usability of the built environment for architects, engineers, and

builders. It is regularly updated by the national publishing company that is owned by the Swedish building industry, now running on its seventh edition.

Accessibility and usability requirements labelled as cost generating.

During the 1990s, the PBL system became operable through a series of changes and reforms of both the law and the regulations. The previously mandatory requirements of the old building regulations were converted into functional requirements for the developers to integrate in the architectural design. In 1995, the system was complete with building regulations with new functional requirements based on the previous regulations but also new or updated aspects according to research on the fit with users having disabilities or using assistive equipment. The building regulations used a written format that first introduced the requirement to fulfil in the built space, then followed one or several pieces of advice or recommendations on how to concretely arrive at the desired functionality. Coinciding with a severe financial recession during the early 1990s that affected the building sector, the new building act with appurtenant regulations was put to practice in minor building projects, often refurbishments of existing old people's homes that were converted into modern residential care homes with studio flats. The recession halted the production of new dwellings resulting in a housing shortage crisis.³² The Swedish housing market is still suffering from these effects from the 1990s, since the number of new dwellings was as low as it was by the end of the 19th century. Following the Swedish signature of the UN CRPD in 2009, accessibility was associated with the concept of usability to create a new twin concept for the PBL system.³³

Nevertheless, during the first decade of the new millennium, larger Swedish building companies started to criticize the PBL system. Typical for Sweden, the building market is dominated by five exceptionally large companies with building projects that is located both in Sweden, but also to other parts of the EU or even worldwide. With this experience, the building industry can compare other building legislations with the Swedish PBL system. The German legislation is an often-used example, described as more efficient than the PBL system. The building industry has detected several shortcomings, for instance a comparable slower pace in the municipal physical planning. Furthermore, the municipal handling of building permits at the municipal building administrations is described as time-consuming.³⁴ The quality control system is seen as poorly functioning. The building industry also criticizes accessibility and usability requirements for being cost generating and restricting architectural design. The building industry soon sharpened the critique, since the PBL system also allowed the Swedish municipalities to assume different stances in the realization of the national disability policy. Consequently, the twin concept was targeted as the major cause for increased building costs and, thereby, for the continued problem with housing shortage.³⁵

STRIVING TOWARDS INCLUSIVE AND SUSTAINABLE BUILDING

The PBL is still in force, but it has undergone two reforms to meet the critique of the building industry. In 2010, the building code was reformed to address the problems with the quality control system by redirecting the control to the execution of building process rather than assessing the perceived quality in the building.³⁶ Over the period 2011-2017, additional changes have mainstreamed functional requirements further so that residential architecture require even less minimum space. The changes have also targeted accessibility requirements. Firstly, the municipal freedom to choose an individual level for accessibility and usability requirements were limited to being only applicable to municipal real estate. Secondly, attempts were made to apprehend the cost-generating effect of existing requirements, merely detecting a potential increase of approximately 3-5 per cent in a case study of student-housing. However, student housing and smaller flats have been exempted from the accessibility requirements in the PBL.³⁷ In 2018, the left-wing government appointed a parliamentary committee to investigate

potential hinders with the PBL and appurtenant regulations. The committee report prompted the government to give a commission to the national Board of Housing, Building and Planning (BHBP) to completely rewrite the building regulations. The revision shall have a new format without advice and recommendations. Advice and recommendations about an appropriate design of accessibility and usability supposedly hinder innovative thinking in architectural design.³⁸

In 2023, the rewritten regulations were submitted to public consultation with the building industry and the municipalities.³⁹ The new regulations clearly define the responsibility between developer and the legal control, but the new regulations have been met with severe critique, this time from both the building industry and the municipalities. Both actors believe that the new regulations will create even more problems than the ones that exist today. They find the regulations describing a clean slate which will force these actors to develop their own new guidelines. Their expectation was that this would be done by the BHBP. Also, the verifiability of the requirements being compliant with the PBL requirements has been put on the building industry. This forces the building industry to develop guidelines, measurements and solutions that can verify the fulfilment of the legal requirement. On reasonable grounds, the UN committee for the implementation of the CRPD criticizes Sweden for inconsistencies in legal frameworks when it comes to the rights of people with disabilities and the promotion of an accessible and usable built environment.⁴⁰

CONCLUSION

The anthropogenic imprint on contemporary Swedish architectural designs has led to a cul-de-sac. Accessibility and usability requirements of the built environment are fundamentals for creating inclusion and participation for people with disabilities. Initially, being an initiative from both functionalistic architects and the building industry to define and improve an improved quality in Swedish housing, minimum requirements for the human fit with the built environment has turned into a farce for creating an inclusive built environment. On the threshold to the sustainable society, the Swedish situation demonstrates that these fundamentals cannot rely on a consensus thinking among players on the building market, but, rather, require a state control through a regulatory system that make accessibility and usability into integral parts of an overall architectural quality. There is an urgent need to define a New Architectonic Modulus for the 21st millennium that builds upon the gains of work during the 20th century with creating accessible and usable types of built environment for an inclusive society. Modern building must define an anthropo-existential approach for architectural design that makes use of assistive technologies, building technologies and investment plans to create livable environments for all. The built environment for the future sustainable society must follow the existential needs of the ageing welfare state – acknowledging accessibility requirements for a long-term usability perspective is the first step towards the New Architectonic Modulus of the 21st century.

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ASSESSMENT OF WATER ACCESSIBILITY IN OGUDU LOCAL COUNCIL DEVELOPMENT AREA OF LAGOS STATE

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INTRODUCTION

Water remains one valuable commodity to humanity as it is a means of livelihood.¹ Its relevance cuts across important phases of human affairs, especially in the aspect of economic, social development and the attainment of adequate sanitation.² In measuring the accessibility to adequate water in Lagos state. Accessibility to adequate water supply is a subject of the economic status of the residents.³ This suggests that the high and middle income earners are more privileged to accessing this essential commodity as compared to the low and no-income earners.

The Sub-Saharan part of Africa is expected to experience triple its population in the year 2050 and therefore calls for the need to formulate anticipatory approach towards ensuring that water and sanitation is taken into consideration for the escalating population.⁴ The possibility of the residents of Lagos being exposed to issues pertaining to sustainable housing, particularly in Ojodu Local Council Development Area (LCDA) can be justified in the assertion that the low and no-income earners are deprived of urban basic needs.⁵ More than 50% of the water need in Lagos state was served by Non-State actors thereby making glare the incompetence of the Lagos State Water Corporation (LSWC).⁶ The study further stated that this failure has enabled such non state actors as water tanker operators, water cart-pushers, borehole water sellers among other commercial services that are not under the regulations of government to participate in ensuring the provision of water to the people. In this regard, some of the inhabitants of Ojodu L.C.D.A. do not have access to public water supply hence may pay exorbitantly in order to access water and to maintain proper sanitary practices. Several initiatives have been attempted by the local authorities in the past, but are yet to yield something substantial, towards solving the problem. This justifies the essence for this research.

STUDY OBJECTIVE

To examine the accessibility of potable water in Ojodu Local Council Development Area of Lagos State, Nigeria.

LITERATURE REVIEW

Although there is no constitutional provision that suggests man's right to water in the Nigerian Constitution of 1999, however it laid emphasis on the fundamental human right to life. This is backed by WHO & UNICEF with the opinion that access to safe and adequate water to an extent curbs the occurrences of death caused by water borne diseases thereby prolonging one's life.⁷ Access to water is a fundamental human right.⁸ Having access to water and sanitation somewhat leads to the realization of

right to life, the right to housing, and health.⁹ Every person must have access to 50 liters of water per day.¹⁰ Access to water postulates that every person must have 25 liters of water per day, at a maximum distance of 200 metres.¹¹ This is contrary to the opinion which purports that the Nigerian government suggests 115 liters per person per day.¹²

Africa is still behind other continents in the attainment of accessibility to water and sanitation as stipulated by the Sustainable Development Goals (SDG 6).¹³ Sub-Saharan African countries still lag in the provision of accessible water supply and improved sanitary practices.¹⁴ Accessibility to sanitation and water is subject to “household preference”, “the willingness to pay” and “the capacity to finance the said service”.¹⁵ The study also explained that there is a bridge between the people, accessibility to water and sanitation and this is often crossed by the well-to-do in the society as the cost of providing water is often estimated along with the cost of housing thereby making it exorbitant and unaffordable to the poor households.

The Ethiopian government has over the years reduced the standards of livelihood, consequently fixing the average per capita per day per person, and the maximum distance standard of water accessibility at 15 liters, and 1.5 km respectively, as against the 20 liters and 1km set by WHO and UNICEF.¹⁶ Despite that, the national standards have not been met. The people travel long distance (between 2.78km to 8.81 km) and wholesome hours to get unsanitary and hygienic water for their daily use. The study therefore heavily condemned the escalation of water issues, opining that it aggravates gender inequality and therefore calls for urgent response from well-meaning regional leaders in a bid to ensuring the provision of safe drinking water. Ethiopia, being the most populated landlocked country in the world is exposed to adverse impacts of climate change.¹⁷ As a result, there is the likelihood of water inadequacy and inaccessibility in the North African country and this problem may be different from other African countries, especially Nigeria.

METHODS AND STATISTICAL TOOLS:

The research was empirical in nature, as it required data gathering from the field. Data was obtained from both primary and secondary sources and the data types were both qualitative and quantitative. From an estimated sample frame of 107,305 persons as respondents, the Taro Yamane sample size formula was used to reduce the sample size to 399 respondents. The systematic probabilistic sampling techniques was employed in questionnaire administration because it ensured a geographic spread (all streets were captured). Data was subsequently analysed with the use of frequency tables and Nearest Neighbourhood Analysis (NNA) statistical tools.

RESULTS AND DISCUSSIONS

The discussion of results revolves around 4 major concerns, which are: source of water, distance travelled to obtain water, water providers, time required to access water and cost of obtaining water in Ojodu LCDA.

A. Source of water

Data from table 1 reveals that the major source of water in Ojodu LCDA is Borehole. Other sources exist, but cannot be compared to borehole, which is from private providers. The quality of water or volume available cannot be verified, the data gathered only reveals the source. This data reveals the absence of State actors in the provision of potable water in the study area. The indiscriminate sinking of individual boreholes could also have effects on the tectonic structure of the earth crust.

Options	Frequency	Percentage
Protected dug well	90	22
Borehole	282	71
Rain capture	4	1
Surface water	0	0
Pipe borne (From Government)	23	6

Table 1. Source of water

B. Distance to nearest source of water

This variable was analyzed using the Nearest Neighborhood Analysis (NNA) method which measures the spread or distribution of a given phenomenon over a specified geographical area. The employment of the method is hinged on the fact that it can provide researchers with a numerical value for the clustering of a geographical phenomenon thereby allowing such value to be compared accurately with other places. It can be illustrated using the formula:

$$R_n = \frac{D(\text{Obs})}{0.5 \sqrt{\frac{a}{N}}}$$

Where:

D (Obs) = the mean value of the nearest neighbor distances

a = the area sampled

n = the number of points (which in this case is water source)

NB: A selected part of Olaleke Taiwo and Obokun Street was sampled for this calculation. In view of that, the mean value of the nearest neighborhood distances of ten buildings was sampled, beginning from adjacent of Aina Street (the T-Junction) and choosing randomly from among the buildings within the 52,020m² that was sampled for this Nearest Neighborhood Analysis calculation. The calculation was carried out thus:

$$D(\text{Obs}) = \frac{34+50+30+39+60+50+17+20+16+25}{10}$$

$$D(\text{Obs}) = 34.1$$

a = the area sampled = 52,020 m²

N = 10

$$R_n = \frac{34.1}{0.5 \sqrt{\frac{52020}{10}}}$$

$$R_n = \frac{34.1}{0.5 \sqrt{5202}}$$

$$R_n = \frac{34}{0.5 \times 72.12}$$

$$R_n = \frac{34}{36.06}$$

$$R_n = 0.94.$$

It is therefore important to note that the Nearest Neighborhood Analysis (NNA) value falls between the ranges of 0 to 2.15. NNA gives three categories of measurement which could either be clustered, random or regular; if the result falls between the ranges 0 to 0.7, it is considered clustered. If it falls between the ranges of 0.7 to 1.3 it is considered random, and if it falls between the ranges of 1.3 to 2.15, it is

considered regular. Hence, in a bid to drawing inference from the calculation above, it can be deduced that: the distance to the nearest water source in Ojodu is random. This finding resonates with previous studies that discovered that water sources, especially freshwater are scarce and not evenly distributed.¹⁸ On the average however, according to investigation, the people had access to water at 120.8 metres away from respective residences. Majority of the people had access to water at less than 150 metres away from their homes.

C. Water providers in Ojodu LCDA

Unlike in developed countries where water is provided by the government; in Ojodu LCDA, only 2% of the respondents have their water provided by the government. Table 2 reveals that privately owner commercial borehole operators and cart pushers control majority of water supply. There is limited effort of non-governmental organizations in the provision of water. Since majority of the water is obtained from cart pushers and commercial borehole operators, which are largely unregulated, it puts the people at risk because the quality of water being provided is not checked or approved by any regulatory authority.

Options	Frequency	Percentage
Landlord	55	5
Cart pushers	150	38
Government	20	14
Commercial	172	43
NGOs	2	0.5

Author's field survey, 2021
Table2. Water providers in Ojodu

D. Time taken to access water

$$R_n = \frac{D(\text{Obs})}{N}$$

$$= \frac{0.5 \sqrt{a}}{N}$$

Where:

D (Obs) = the mean value of the nearest neighbor distances

a = the area sampled

n = the number of points (which in this case is water source)

D (Obs) = 57, 16, 18, 18, 18, 40, 16, 16, 18, 17, 22, 16, 16, 10, 14, 17, 17, 23, 17, 17

N = 20

a = the area sampled = 30,825m²

$$D(\text{Obs}) = \frac{57+16+18+18+18+40+16+16+18+17+22+16+16+10+14+17+17+23+17+17}{20}$$

$$D(\text{Obs}) = 20.15$$

$$R_n = \frac{20.15}{\frac{0.5 \sqrt{30,825}}{20}}$$

$$R_n = \frac{20.15}{0.5 \sqrt{1,541.25}}$$

$$R_n = 20.15$$

$$0.5 \sqrt{1,541.25}$$

$$R_n = 1.026.$$

From the calculations above, the time taken per trip to collect water in the neighborhood is random; that is, it ranges between 0.7 to 1.13 which therefore implies that time taken to collect water is directly proportional to the distance between the sources of water supply. Meanwhile, the water supply however is not sited at equidistant location to the residencies. Because of this distance, majority of the people spend about 30 minutes traveling to access water. This implies water is not readily accessible in Ojodu LCDA.

E. Cost of water

The cost of water is relatively affordable in Ojodu LCDA. Data from Table 3 below reveals that each person requires an average of Four hundred and Fifty Naira (N450) daily to meet their individual water needs for the day. The Dollar value of this amount, using an exchange rate of one thousand, five hundred and forty naira to one dollar (N1540-\$1), is 0.3 dollar per day. However, this could be adjudged unaffordable when one considers the general cost of living and other competing expenditures.¹⁹

Options	Frequency	Percentage (%)
N350 to N550	316	79.2
N551 to N700	70	17.5
N701 to N1000	11	2.8
Above N1000	2	0.5
Total	399	100

Table 3. Respondents' household daily water expenses

SUMMARY OF FINDINGS

The major source of water in Ojodu LDCA is the borehole, which is being provided by private commercial vendors. It takes an average of about 30 minutes to access water at a debatably affordable rate. To access this water however, residents are required to travel an average of 120.8 meters.

CONCLUSION AND RECOMMENDATION

Since privately owned commercial boreholes have been found to be the major source of water at Ojodu LCDA, albeit at a cost, it is recommended that the Lagos State Water Cooperation (LSWC) conduct immediate investigation and audit of their infrastructural facilities to commence public/government water supply to residences at a more affordable rate. This would forestall the arbitrary sinking of boreholes in individual residences and would save time, money and energy spent on accessing water on a daily basis. Intervention from foreign donors should also be research based because previous intervention programs that failed were politically influenced.

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THE CONTRIBUTION OF ALLOTMENTS TO THE PLANETARY HEALTH AND SOCIAL CHANGE

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INTRODUCTION

Disasters and pandemics that have occurred in the last decade have led societies to seek collaborative, sustainable and adaptable solutions to respond to profound social changes. The results of the surveys conducted by different institutions show that especially with the COVID-19 pandemic, the feeling of loneliness felt by individuals in the society has increased, and that encouraged the local governments to carry out various studies to increase the interaction between individuals in the society and improve public health.

The COVID-19 pandemic has spurred new approaches to social change, including increased interest in allotment gardening as a means of accessing urban green spaces amid lockdowns. Allotment gardening has become a powerful tool for improving people's health and well-being, as well as strengthening social relationships. This study explores the role of allotments in improving planetary health and examines strategies to increase the accessibility of green spaces, and thus social relationships for social benefit in a sustainable context.

The Health of Society

In recent years, societies are getting lonelier, and this increases the peoples' sense of insecurity. According to the Age UK, more than 2 million people in England over the age of 75 live alone, and more than a million older people say they go over a month without speaking to a friend, neighbour, or family member.¹

Another survey conducted by the UK Mental Health Foundation (MHF) in 2010 reports that the number of participants who feel lonely "often" or "sometimes" is mostly seen among the age group 30s and 40s. In addition to this 48% of the participants believe that societies are becoming lonely.² However, the loneliness is not an issue only observed among elderly, but it is also growing problem among younger generations. Nearly 88% of Britons aged from 18 to 24 say that they experience loneliness to some degree with 24% suffering often and 7% saying they are lonely all the time.³ At the beginning of the pandemic, levels of loneliness were almost the same, with 5% of adults in the UK saying they often or always felt lonely, but by February 2021 this had risen to 7.2%.⁴

When we consider these reports, it is obvious that a change is necessary in social life, especially in the relationships between individuals in the society. Alison Tonkin and Julia Whitaker,⁵ both have research background in health and children, state that the public priorities that based on common values such as family and relationships need to be considered for changes. They emphasize the importance of social

connections and relationships on people's physical and mental health and underscore their impact on the health of the societies.⁶ Planetary health, which emerged as a field in previous years and gradually growing since then, explores the relation between the degradation of Earth's natural systems because of human endeavours and addresses its ramifications for human health.⁷ As the authors mentioned, the health of the society relies on the relations between individuals and their interaction with the environment as well.⁸

Since the humanity has been facing with various disasters, pandemics, they also cause deep changes on the society and social life. Societies are looking for more collaborative, sustainable, and adaptable solutions to continue their existence. According to Marjoribanks,⁹ to respond positively to societal change, and to foster the conditions necessary for people to adapt and thrive, local action should be taken by the central government.

Social Change

Since the social innovation is essential for addressing complex societal challenges and fostering sustainable development, it involves the creation and implementation of new ideas, processes, and practices that improve the well-being of individuals and communities. Ezio Manzini¹⁰ describes the task of social innovation as a design action that *“seeks to make these ways of being and doing things (that is, the existence of these collaborative organizations) both possible and likely”*.¹¹ However, it needs to be noted that a sustainable social innovation requires cooperation not only from governments but also from all parties involved.

Social innovation often arises from collaborative efforts involving various stakeholders, including government agencies such as councils, businesses, non-profit organizations, and citizens. Social innovation initiatives can lead to transformative change and positive social impact by tapping into the collective creativity and resources of different actors.

The local design decisions during the COVID-19 period observed in different formats in the context of social change. Lock downs and accessing to open spaces forced people to look for solutions. One of the solutions was seen as accessing the allotments in UK. However, findings from a survey conducted by the National Society of Allotment and Leisure Gardeners (NSALG), the leading national representative organization for the allotment movement in the UK, revealed that 40% of responding councils observed a significant uplift in applications to join waiting lists during April.¹²

RESEARCH ON ALLOTMENTS

In the literature there are various terms that are linked with allotments. For instance, the Food and Agriculture Organization (FAO) of the United Nations defines urban agriculture gardens as *“any gardens/areas of agricultural land within the municipal boundaries”* and they categorize these gardens as community gardens, which involve *“any piece of land gardened by a group of people, utilizing either individual or shared plots on private or public land”*.¹³ In the UK, allotments are defined in Allotments Act, 1922 as *“allotment garden is an allotment not exceeding forty poles in extent which is wholly or mainly cultivated by the occupier for the production of vegetable or fruit crops for consumption by himself or his family”*.¹⁴

Allotments and Their Brief History in the UK

Allotments have a rich history dating back to Anglo-Saxon times, but their modern form emerged in the 19th century. In the beginning, the allotment demand came from the middle classes who were looking for a space to grow their own and to relax. These became an obsession in 19th century and the ones who have an allotment were seen as wealthy. During World War II, allotment holding reached its highest point because of initiatives like the ‘Dig for Victory’ and ‘Grow More Food’ campaigns.

However, in the 1950s and 1960s, allotments experienced a decline as people increasingly turned to purchasing food from new supermarkets and convenience stores rather than cultivating their own. Beside those, the widespread adoption of television sets, and increased car ownership all played a role in this decline.¹⁵

One of the most important developments in the history of allotments came with the Thorpe report of the 1960s. The report recommended significant changes, including rebranding allotments as “*leisure gardens*” and expanding their scope beyond food production to encompass recreational gardening. However the legislative changes were slow to materialize, and the Allotments Acts of 1922 and 1925 remained the primary legislation governing allotments in England. Nevertheless, the report reflected a growing recognition of the need to adapt allotments to changing societal needs and preferences.¹⁶

Despite periods of decline, allotments continue to hold significance in both urban and rural settings, valued for their contribution to community wellbeing, green spaces, and sustainable food practices.

Studies on Allotments Around the World

In the UK, The National Allotment Society works with government at national and local levels, other organisations and landlords to provide, promote and preserve allotments for everyone.¹⁷ However, renting an allotment for generations and the increase in interest in gardening during the COVID-19 pandemic affected the balance of supply and demand. According to the findings of a survey by the National Society of Allotment and Leisure Gardeners, with the COVID-19 period, UK local authorities have been observing an increase in applications for allotment gardens, leading to waiting lists to get an allotment.¹⁸

The studies on impact of pandemic on allotment gardening show that despite the challenges faced in many areas, COVID-19 has also created opportunities. By allowing people to spend more time in their allotments, especially during isolation periods, it has increased interaction among the community and encouraged food independence by alleviating the problem in food chains.¹⁹

Genter et al (2015)²⁰ conducted systematic research by using the allotment, garden, health and wellbeing, and selected 10 papers to investigate if allotment gardening contributes to health and wellbeing. Their findings show that allotment gardening has impact on health and wellbeing and therefore recommended as occupational therapy for people since it acts as a stress reliever.²¹

The research, that is conducted by Edmondson et.al. (2020)²² on UK cities mostly focusing on Leicester, shows that based on the numbers of allotments, nationally *1.7 million people being fed on a 5-a-day diet by allotment gardeners*. This study proves that the use of urban land for allotments can contribute over 2% of the fruit and vegetable diets of urban inhabitants in a typical UK city.

A survey conducted in Berlin, among 466 gardeners and 80 non-gardeners, also shows that the allotment gardens not only have a positive impact on food production, but it also has an important role on biodiversity conservation and social environmental interaction.²³

Another research conducted in Oslo in 2016, highlights the increase in interest in urban allotment gardens resulting in a waiting duration of 10 to 20 years. The research findings show one more time that having a plot in an allotment garden has health benefits both physical and psychological.²⁴

In Singapore, various urban horticulture programs have been implemented since the 1990s to encourage individuals and organisations. Among these initiatives, the Allotment Gardening scheme was introduced in 2016 by aiming to provide gardening spaces to individuals interested in gardening independently. During the pandemic, studies indicated the positive effects of gardening activities on mental wellbeing and connection with nature. After the success of the scheme, the National Parks Board launched the Gardening with Edibles program in 2020. This initiative encouraged citizens to cultivate edible plants at home during the pandemic by providing seed packs to participants. Feedback from

participants revealed that engaging in gardening activities not only enhanced their mental resilience but also provided a sense of relaxation.²⁵

The research carried out on behalf of Newcastle City Council and the Allotment Working Group in 2010 also mentions the benefits of allotments in their report as; cheap source of fresh fruit and vegetables, good form of exercise and recreation, opportunity to spend time outside and to enjoy nature.²⁶ In the UK Parliament (2023)²⁷ records, the allotments and their contribution to society’s physical and mental health is also highlighted. In the records the result of a survey conducted by RHS in December 2022 is published. The result of the survey shows that gardening has a positive impact on mental health, physical health and social wellbeing²⁸.

There are approximately 330,000 allotment plots across the UK, most of which are council owned. The Parliament report includes reports from various provinces, emphasizing that gardening is an activity that supports the physical and mental health of society and also contributes to the economy.²⁹

RESEARCH METHODS AND FINDINGS ON ALLOTMENTS’ BENEFITS ON HEALTH AND SOCIAL CHANGE

In this study, to gain an understanding of allotments benefits on health and wellbeing, surveys, interview and participatory research have been adapted as research methods. Interviews were conducted with allotment owners before the survey and considering the common statements of the participants and the understanding gained from previously published research, it was seen that the participants waited for a certain period of time to own an allotment and managed to become an owner in many ways.

These findings formed the basis of the survey designed to gain a deep understanding of the topic. The use of allotments during the COVID-19 pandemic, the activities carried out by the participants on their allotments, and the benefits of gardening according to the participants, were investigated through the survey. The survey was completed by 71 participants, comprising 50 females, 20 males, and 1 who preferred not to disclose their gender.

According to the results of the question asked about visiting gardens or doing gardening during the COVID-19 pandemic; 25% visited their own allotments, 45% engaged in gardening activities in their own gardens, and 8% visited allotments belonging to friends or parents.

Ownership of allotments was prevalent both before and after the pandemic, with a noticeable increase in applications during the pandemic. Prior to the pandemic, 24% of participants owned allotments, while 2% applied for one during the pandemic, 5% applied and owned during the pandemic, while 16% became allotment owners after the pandemic.

Participants were presented with statements regarding allotments and asked to select one or more options. The result is shown in Figure 1.

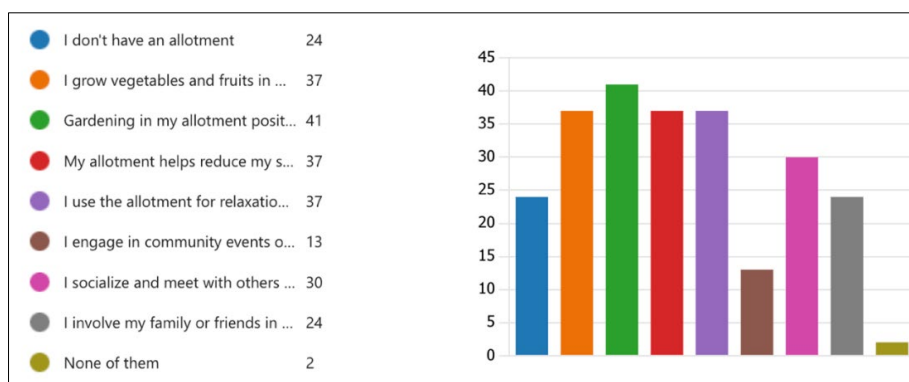


Figure 1. Survey question “If you have an allotment which statement or statements are true for you?” result.

According to the survey results, most of the participants believe that gardening in their allotments has a positive impact on their mental health and they find allotments useful for relaxing, having good time and socializing with other people. The activities the allotment owners carry out in their allotments are determined as illustrated in Figure 2.

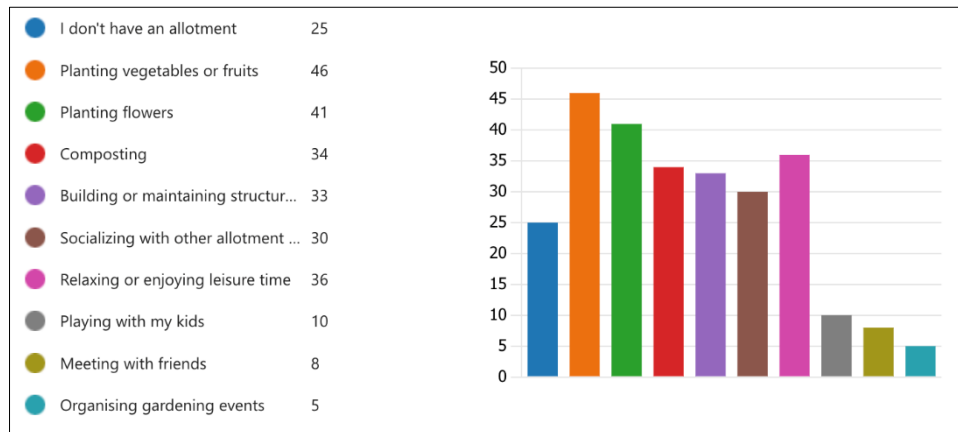


Figure 2. Survey question “If you have an allotment, what kind of activities do you carry out in your/your friend’s/your parent’s allotment?” result.

In addition to the survey, interviews are conducted with the allotment owners. Interview 1³⁰ is conducted with an academic staff (46) who has a wife and son and wanted to own a green garden for his wife who needed a peaceful and quiet place to work during the summertime. They used to have a communal garden with neighbours, and they applied for an allotment to have their own garden. They were in waiting list during the COVID-19 period and then had their own garden in August 2023. They have been raising some fruits, and lavenders for bees in their allotment. They usually visit their allotment during the weekend and do some activities such as gardening, having picnic and studying. They think the place itself and the activities are both good for their health and wellbeing. Interview 2³¹ is conducted with another allotment owner. He also highlighted the waiting list but stated that they were called to have their own garden at short notice. They said the soil was not suitable for growing plants, so that they prepared planting beds and filled them with different soil to cultivate various vegetables and fruits. The responses from the interviewees predominantly drew from personal experiences, offering insights into various aspects such as the duration of wait times for obtaining an allotment, how individuals utilized the opportunity to participate in allotment gardening, and the motivations behind acquiring an allotment, among other factors. Apart from the interviews, participatory action research was conducted to observe the activities in the allotments, how these activities affect human health and encourage the interaction between individuals.³²

The participatory action research was conducted during an event which has been organised by an allotment owner. The organizer has been gardening his allotment with his family especially the weekends to have fun, eat healthy food and supporting his and his family’s health and wellbeing by spending time outdoors. He created Facebook and WhatsApp groups to provide an interaction garden to the community who interests in gardening.³³

In this 2-hour community gardening event, 9 participants/volunteers engaged in activities such as planting, weeding, and watering together. The event welcomed everyone from experienced gardener to beginners. During the event the participants quickly came together, meet each other and shared some tasks that needed to be done in the allotment area.³⁴

The event was a very good example of how urban green spaces, allotments and community gardening events bring people together; encourages the collaboration; reduces the lack of communication among people which occurred mostly during the COVID-19. This showed that allotments serve not only to improve individuals' physical and mental well-being but also as a catalyst for building stronger, more cohesive societies.

In addition to the above-mentioned personal initiative-based, solution-focused individual and group initiatives have emerged in response to extensive waiting lists.³⁵ One of them is the 'Roots' initiative, established by four friends in 2000. This initiative was designed as a response to the prolonged waiting list and aimed to help people grow their own food and plants during lockdown. On the other hand, as they mentioned on their 'story' if everyone can grow their plant; this small effort will have a big impact on planetary health.³⁶

CONCLUSION

Since the beginning of the 19th century, allotments have been playing a crucial role in promoting sustainable agriculture, biodiversity conservation, and community resilience. Although they started as a response to the need for food production among the labouring poor and turned to the symbol of status among middle classes, they always provided benefits to the society and be part of the social change. Although there were declines due to changes in social life in the post-war period, it became popular again during the COVID-19 period and remains popular.

Besides providing space for individuals and communities to grow their own food, contributing to the food security and reducing dependence on industrialized agriculture, the gardening activities in allotments promote physical activity, mental well-being, and social interaction, fostering stronger community ties and social cohesion. They can also serve as learning environment for individuals and support their skills, encourage knowledge sharing. Through gardening workshops, community events, and educational programs, allotments offer opportunities for individuals to learn about sustainable farming practices, biodiversity conservation, and environmental stewardship. This knowledge exchange not only empowers individuals to make informed choices about their food consumption but also fosters a deeper connection to nature and a sense of responsibility towards the environment.

In addition to their environmental and health benefits, allotments also have the potential to drive social change by promoting inclusivity, diversity, and community empowerment. Allotment gardening activities eliminate social and cultural boundaries, bring people together from diverse backgrounds and foster a sense of belonging and shared purpose. Moreover, allotments can serve as platforms for collective action by enabling communities to address broader issues such as food justice, urban regeneration, and sustainable development.

In conclusion, allotments represent more than just gardens for growing fruits and vegetables—they are dynamic hubs of social innovation, community engagement and interaction. By considering the potential of allotments to support planetary health and social change, we can create healthier, more resilient and equitable communities and more liveable cities for future generations. To achieve this, all stakeholders need to come together to find solutions to provide more space for people, organise community gardening activities and encourage sharing and socialising. This will create a healthier society that improves both physical and mental wellbeing.

NOTES

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COMPACT INVESTMENT-DRIVEN HOUSING IN BRAZILIAN METROPOLISES CREATES A REAL ESTATE NICHE FOR THE YOUNGER

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INTRODUCTION

The surge in compact real estate, typically measuring less than fifty square meters, has emerged as a trend in global cities. This phenomenon correlates with the concentration of intellectual and creative professionals within urban centers, which show a flexible approach towards their living situation if it is temporary. It also relates to demographic shifts, such as generations Y and Z delaying family formation or choosing alternative lifestyles. Concurrently, the financialization of real estate, driven by technology companies offering streamlined rental processes, plays a pivotal role in reshaping urban housing landscapes when focusing on transitory urban dwellers.

Our research aims to explore these intertwined factors and discuss the hypothesis that financial strategies in real estate markets target increasing urban space profitability by promoting housing turnover through rhetoric emphasizing the detachment of contemporary life from the traditional dream of owning real estate. Despite this trend, the aspiration of homeownership persists, albeit delayed by the allure of compact, hassle-free residences. These smaller dwellings serve as a steppingstone for younger generations, granting access to the real estate market considering the mounting challenges in attaining larger properties due to low income and soaring prices. Consequently, decisions regarding acquiring larger properties are contingent upon the professional trajectories of generations Y and Z and their familial progressions.

This research offers insights into the transformative impact of compact real estate trends on urban housing markets in Brazil, shedding light on evolving consumer behaviors and preferences. We expect the results to highlight upcoming challenges for livable cities concerning how young generations access the real estate market. After a brief literature review, we present our study methods, results, and conclusions.

INTERGENERATIONAL REAL ESTATE CONSUMING HABITS

Social, economic, and cultural factors condition individuals' transitions from their parental homes or from renting to homeownership. In more conservative societies, such as China, transitions to first property ownership have become synchronized with family formation among younger generations, indicating the social norm of the "conjugal home".¹ However, the generational perspective provides a lens for understanding the real estate market beyond social and cultural formations.

Boomers were pivotal in shaping real estate consumption patterns over decades. This generation was profoundly influenced by the ideal of the "homeownership dream," normalized within the middle class, which benefited from tax incentives for mortgages during the American suburbanization, State policies for homeownership during the dictatorships in Argentina and Brazil, and the growth of social housing for working-class families in the United Kingdom. Over decades, this generation witnessed a significant emphasis on the stability and security provided by homeownership, reflected in their housing choices and habits passed down to subsequent generations. Their housing journey, characterized by a deep desire for ownership, contributed to suburban growth and transformations in urban patterns.

Generation X, in turn, emerged in a context of crisis past the economic growth of the West after World War II. As they were born, the 1973 oil crisis marked global economic history, impacting the economy, and leading to many countries' recessions, inflation, and energy policy changes. Similarly, the uncertainties characterizing the Cold War era shaped the pragmatic approach of this generation toward acquiring high-value assets. Generation X played significant roles in economy and culture, challenging conventional expectations, and contributing to innovation and social change.² They pioneered new technologies and forms of communication, driving the development of the internet and digital media and redefining work practices. These new technologies are precisely the driving force shaping the generation that will emerge with the arrival of the 2000s.

Millennials (generation Y) inherited previous generations' expectations about the job and real estate markets. However, they face different realities, such as precarious jobs and financial difficulties accessing the real estate market. Despite this, the preference for homeownership persists among millennials, even with more challenges in saving for an initial deposit and obtaining a mortgage. With variations among countries, young adults spend more time living in rental properties or with their parents. This generation witnessed significant technological advances and cultural transformations that directly impacted their real estate choices as new technologies applied to the real estate market empowered digital business models, especially since the 2008 crisis,³ when millennials were reaching around 23 years old and, thus, forming their family nuclei, even as "urban singles."

A study in the United Kingdom highlights that housing inequalities between boomers and millennials are influenced by political and economic structures, not just the individual actions of one generation on another. Qualitative data reveal that both boomers and millennials recognize the challenges the younger generation faces in accessing housing, thus challenging a media-driven narrative of "intergenerational conflict".⁴ Meanwhile, market research⁵ in Brazil indicates millennials represent only 16% of real estate buyers in 2023, while boomers and Generation X represent 82%. The remaining 2% are Generation Z, which will be addressed later.

However, millennials having difficulty accessing the real estate market is not a rule. A study⁶ analysing the residential mobility of millennials in the United States from the 2008 crisis to the pandemic reveals that, initially, they concentrated in urban areas. However, throughout the 2010s, there was a gradual population shift of millennials toward the suburbs. Thus, while urban neighbourhoods lost millennial residents, suburban areas saw an increase in the number of residents from this generation. The research associates this "return to the suburbs" with issues such as the financial capacity to access housing and the demand for larger residences, which are uncommon or inaccessible in major urban centres. Mostly, these young individuals left areas rich in urban amenities, searching for neighbourhoods with fewer services. Consequently, land use for commerce grew more rapidly in suburban locations. This example underscores the importance of financial accessibility, suitable residence sizes, and local amenities to attract and retain this population segment.

Generation Z emerges in a context of rapid digital transformation and social changes. It is the first generation born in the connectivity era and, therefore, brings unique perspectives on housing shaped by online experiences and connections. After decades of growth, the number of properties millennials rent

in the United States, for example, has peaked and is declining. On the other hand, Generation Z is now the only generation adding renter households. Therefore, the demand for rental housing will continue to grow only if the number of new households rented by Generation Z exceeds the losses caused by the migration of older generations to homeownership.

For both generations Y and Z, high housing prices typically can only be offset if there is wealth accumulated by previous generations of a family, meaning that the ability of the younger generation to own a home increasingly depends on transfers of resources from their parents. If these generations face difficulty accessing homeownership and their lives unfold in both the digital and physical spheres, it renders the perfect context for digital platforms advancing the insertion of compact investment-driven housing into urban rental markets.

METHODS

The methodology begins with developing, testing, and implementing a structured questionnaire to verify changes in the dynamics between individuals and real estate products. Concepts and insights from prior research stages and literature review guided the formulation of the questionnaire. It was conducted in Portuguese, online, between November 27 and December 31, 2023. Respondents addressed queries related to demographic variables through multiple-choice questions, and their perspectives on real estate consumption habits and market dynamics were captured using a five-point Likert scale. The study's sample consists of 545 individuals inhabiting urban territories in the South, Southeast, and Northeast regions of Brazil, representing its most urbanized areas.

The demographic distribution of generations among participants revealed the following composition: boomers (14.5%), generation X (27.9%), generation Y (47.3%), and generation Z (10.3%). Generation Z respondents' relatively minor representation arises from deliberately excluding underage individuals (18 years old). Geographically, most participants were situated in South Brazil (57.2%), followed by the Southeast (32.3%) and the Northeast (10.5%). To comprehensively explore respondents' demographics, interested parties can acquire detailed data through direct inquiry with the authors.

Upon applying the questionnaire, exploratory factor analysis (EFA) was applied to discern a condensed set of latent factors that were not directly observable. These factors are posited to elucidate the correlations among a set of observed variables. The representation of the factorial model can be delineated as the vector of observed variables, denoted as $X = [x_1, x_2, \dots, x_n]$, where n signifies the total number of variables. The factorial model is then expressed by the equation $X = \Lambda F + \epsilon$. Herein, X signifies the vector of observed variables, Λ represents the matrix of factorial loadings that establishes the connection of each observed variable with the latent factors, conveying the intensity of the association between each observed variable and each latent factor. Meanwhile, F encapsulates the vector of latent factors symbolizing the theoretical and psychological dimensions identified in the analysis, and ϵ encompasses the vector of unique error terms for each observed variable, representing the unexplained variance by the factors in each variable.⁷

The factor extraction method employed was "maximum likelihood," coupled with an oblique rotation of the "oblimin" type.⁸ Acknowledging the correlation between the latent factors F is embraced through oblique rotation, aligning closely with the nuanced reality investigated within the social sciences. The evaluation of the model's adequacy was executed through metrics such as the Kaiser-Meyer-Olkin (KMO) for sample adequacy and the Tucker-Lewis Index (TLI) for model fit.⁹

Finally, the Kruskal-Wallis analysis of variance (ANOVA) is employed to compare the medians of three or more independent groups. The null hypothesis (H_0) posits that all samples come from the same distribution, meaning the medians are equal. The alternative hypothesis (H_1) suggests that at least one of the medians differs. Following the Kruskal-Wallis test to identify significant differences between groups, *post hoc* analyses were conducted to explore these differences in detail. For this purpose, paired

comparisons were employed using the Dwass-Steel-Critchlow-Fligner pairwise comparisons (DSCF) method, which allows a detailed assessment of differences between pairs of groups while controlling for errors in multiple comparisons. The results of these comparisons were interpreted based on adjusted p-values. All statistical procedures used *Jamovi*.¹⁰

RESULTS

The factorial model discerned three primary dimensions encapsulating varied perspectives regarding real estate consumption profiles. These dimensions revolve around personal security, juxtaposing property ownership with financial investments, and prioritizing life experiences over acquiring material possessions. These factors draw support from empirical observations and literature, offering insights into the intricate tapestry of attitudes toward property and investment. After applying EFA, the study variables have been organized as delineated in Table 1.

Variables	Factor Loadings		
	1	2	3
v1- Living in a self-owned home, free from rental burden, is essential for a secure and stable life.	0.591		
v2- Individuals resort to renting accommodation only when they face challenges acquiring their property.	0.596		
v3- Homeownership is vital for experiencing a sense of security within society.	0.814		
v4- Owning a property is better than investing in financial assets.		0.946	
v5- Investing money in owning a property is safer than investing in financial assets.		0.631	
v6- Investing money while paying rent is more advantageous than paying a mortgage to own real estate.			0.538
v7- Housing is increasingly becoming a service; in this context, owning a property is less crucial than it once was.			0.720
v8- Spending money on life experiences brings more happiness than buying a property.			0.598
Eigenvalue	1.56	1.51	1.34
Percentual of the total variance	19.4	18.9	16.7
Percentual of accumulated variance	19.4	38.4	55.1

Table 1. EFA results

In this factor model, the KMO index, a measure assessing the adequacy of the sample for factor analysis, is 0.876, which indicates the sample is appropriate for EFA¹¹ and has substantial shared variability within the data. The TLI index evaluates whether the model fits the observed data, yielding a value of 0.997 in this instance, which implies an outstanding alignment of the model compared to the null model. The decision to retain three factors was based on parallel analysis, recommended for considering the statistical significance of eigenvalues in contrast to chance expectations. The EFA outcomes demonstrate that all variables exhibit factor loadings surpassing 0.5, a more rigorous threshold than the conventional 0.3.¹² Notably, all eigenvalues exceed 1, another conventional criterion for factor retention, indicating these factors' substantial capture of variance. The total variance explained by the model reaches 55.1%, a satisfactory outcome for this genre of analysis, particularly in social research contexts.

Variable 1, *Residing in a self-owned home, free from rental burden, is essential for a secure and stable life*, centrally assesses personal and domestic security and stability associated with homeownership. It

emphasizes the impact of owning a house on the individual owner's life, suggesting that homeownership is a key component for a life free from lease instability and increases in the cost of living. This variable is linked to immediate and practical concerns of daily life. Variable 2, *individuals resort to renting accommodation only when they face challenges in acquiring their property*, suggests the perception that renting is a secondary option or a forced choice, not a voluntary preference. This view is rooted in the idea that property ownership is a financial and social milestone symbolizing success and economic stability. Variable 3, *Homeownership is vital for experiencing a sense of security within society*, connects property ownership with a sense of security within a broader social context. It relates to the common sense that owning property leverages social status, the sense of belonging to a community, and a role in the social structure.

These three variables converge to compose **Factor 1, reflecting a mindset anchored in traditional ideas of stability, security, and social status associated with homeownership**. For this profile, residential property ownership is not only a matter of shelter but also a manifestation of personal security and positive integration into the social structure. Paired comparisons indicate that the older the individuals, the more adapted they are to this profile. Factor 1, therefore, represents boomers and parts of generation X.

Variable 4, *Owning a property is better than investing in financial assets*, centralizes around the perceived benefit of having a property from an individual benefit perspective. This advantage can be interpreted in terms of long-term capital appreciation, tax benefits, personal use of the property, or profitability through rentals if the individual chooses not to reside in their property. Aligned to that understanding, variable 5, *Investing money in owning a property is safer than investing in financial assets*, highlights security as the primary concern. Here, the emphasis is on the risk perception associated with different types of investments. Real estate is often considered a "safe bet" due to its tangible nature and historical value stability. At the same time, financial applications may be viewed as more volatile or susceptible to market fluctuations.

Therefore, **Factor 2 reflects a pragmatic understanding of real estate as a financial asset**. While it values homeownership like the previous profile, its motivation is different. Unlike the traditional perspective, the pragmatic one focuses on asset appreciation and financial stability through property ownership, considering it a safer and more advantageous choice than financial applications. Paired comparisons here also indicate that the older the individuals, the more adapted they are to this profile. However, factor 2 captures generation X as much as it captures boomers.

Variable 6, *investing money while paying rent is more advantageous than paying a mortgage to own real estate*, highlights the comparison between investing in financial applications and renting versus buying property to live. It suggests that, in certain circumstances, it is more advantageous to opt for financial investments while renting instead of undertaking the financial commitment of paying a mortgage. In variable 7, *housing is increasingly becoming a service; in this context, owning a property is less crucial than it once was*, housing is portrayed as a service that can be hired and terminated on demand. Under these circumstances, owning property would be less important than it used to be, addressing the evolution of the concept of housing as a service and suggesting that the importance of owning property is diminishing compared to the past. Finally, variable 8, *spending money on life experiences brings more happiness than buying a property to live*, discusses the idea that investing in life experiences brings more happiness than buying real estate, highlighting the growing appreciation for personal experiences over acquiring long-term material goods. Therefore, these three variables explore different perspectives on the relationship between housing, investment, and happiness, reflecting changes in attitudes and priorities regarding property ownership and financial investments.

Thus, **Factor 3 reflects a flexible approach to the real estate market, unlinking financial stability from residential property**. This approach allows for an understanding of the appreciation of diverse

life experiences over the traditional emphasis on homeownership. The preference for investing in experiences over acquiring property reveals a prioritization of immediate experiences and pleasures over wealth accumulation. Paired comparisons indicate that the younger the individuals, the more adapted they are to this profile. Factor 3, therefore, best represents generations Y and Z.

CONCLUSION

The analysis of generational propensities and attitudes towards real estate ownership and consumption can be complemented by considering the behavioural trends associated with different life stages. While older individuals are more likely to have already started families and tend to value domestic life more, seeking the stability and security that owning a property can offer, younger generations are at a life stage where *freedom* is more valued. The flexibility of not being tied to a property allows the younger to explore educational, professional, and personal opportunities without the restrictions that owning a property and the associated debt could impose. This mobility is particularly valued in an era of rapid social and technological changes, where geographical location may be less relevant to career opportunities and personal development than previous generations. Generation X, often caught between these two poles, may value the security of owning a property but is also influenced by mobility and personal experiences, reflecting a transition between the traditional values of boomers and the adaptability of subsequent generations.

Theoretically, the study has advanced the understanding of attitudes toward real estate ownership and investment, incorporating EFA to unveil latent dimensions. This methodological approach contributes to the literature by offering nuanced perspectives on how attitudes toward homeownership intertwine with sociocultural and generational contexts. The analysis of generational variations in attitudes towards real estate ownership can contribute to the debate on the evolution of social and financial norms, highlighting the importance of considering the influence of sociodemographic factors in housing studies.

Our analysis demonstrates that housing preferences are rooted in life stages and corresponding priorities. Recognizing these groups is essential for developing market strategies, housing policies, and urban planning that align with the needs and desires of each generation. These findings confirm an evolution in real estate consumption habits and indicate paths to designing housing policies for liveable cities, implying the need to diversify housing options incorporating solutions such as social rental as affordable housing. In the future, it might be necessary to consider policies for elderly housing for an aging population less inclined toward conventional family formation.

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NOTES

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MOVING FRAMES_TWILIGHT STORIES URBAN SCRIPTING IN JOHANNESBURG

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“Profound social changes and perceived problems with traditional social research practices combined in the 1980s to produce what is now called the ‘narrative turn,’ the increasing interest in professionals inside and outside academia in understanding the centrality of stories in the activities and processes of meaning-making.”¹

INTRODUCTION

The topic of how to enhance the livability of expanding cities is complex. It elicits a critical question: *How can experts fully comprehend the intricate workings of these cities and contribute positively to their development?* In this context, the paper introduces the concept of “Urban Scripting,” where audio-visual storytelling offers a transdisciplinary approach to site assessment of complex situations in an African urban context, with architecture as a protagonist on a multi-scalar spectrum. The re-framing of documentary films and an animation around a tree on a sidewalk in Johannesburg’s Alexandra Township serve as narrative backdrops to untangle life in “The Twilight Zone.”²

The methodology recalibrates close readings of the multiple ways narratives “do things” – how they intervene in the world and affect the everyday lives of those who tend to inhabit the margins of society and space.

Storywork

Urban Scripting ventures into contemporary African street culture in Alexandra, Johannesburg. The narrative turn Donileen R. Loseke³ frames in the epigraph above is the guiding philosophy of this text. As storywork showcasing emergent insurgency, it explores storytelling’s transformative power as a relevant form of site assessment, particularly in the complex contexts of extreme socio-spatial inequality. Nguni oral tradition (local expertise) and traditional mapping cultures fuse with radical audio-visual media techniques (specialist expertise) and advocate for *Othered* knowledge sets of historically marginalized, overlooked and denigrated to be included and amplified in the urban planning process.

Employed in Johannesburg, one of the most unequal cities in the world, *Urban Scripting* calibrates the city’s writing using three movements: *framing*, *shifting*, and *positioning*. This tripartite lens calibrates spatial dynamics from *the twilight zone* – the spaces designed to be inhabitable in a conventionally defined way but remade daily by the *Others* who are forced because of their marginalized circumstances

to recreate them for daily enterprises. Their on-the-ground operations exist in the murky grey domain between what is officially ‘allowed’ and what is not, a space where people create, occupy, serve, and transform the zone on the margins of the economy, the city, and society.

Story Synopsis

The paper reviews the making of a 17-minute audio-visual production about ‘A Tree on a Sidewalk,’ which gives a view of subaltern life in Alexandra while, as illustrated in Figure 1, merging documentary film and animation techniques.⁴ As a reading protocol, documented realities of the now combine narrative theory and the moving image overlaid with the animated imaginary of the past and future. Life [as lived] is captured in 24 frames per second. Within the frame, African voices tell the story of Johannesburg from “The Twilight Zone,” which straddles the domain between legally sanctioned and by-law breaching on-the-ground operations. In essence, the film conveys this *twilight intelligence* through one tree that contextualizes the materiality of survival and resistance within a challenging system of a colonial site.

As the main narrator, Bra Niky, an ‘all life resident’ of Alexandra, shifts the frame to urban spaces remade by people as the operational base of their lives surrounding the tree. These micro-architectures turn into reflective surfaces of the environment itself, mirroring the complex makings of an emerging spatial practice that questions hostile officialdom and highlights the ingenuity and restrictions of DIY urbanity.



Figure 1. Tree on a sidewalk in Alexandra, Johannesburg, Bra Niky in *The Twilight Zone*, Screenshots Left 2:57;14; Right:7:44:20

The audio-visual production is a montage of three research outputs.⁵ Its narrative focuses on the evolution and restructuring of the urban landscape, its politics, and the varying perceptions of those who use it. Visually articulating this transformation across genres sets the stage for a deeper exploration of the dynamics of urbanization and the shifting relationships between built environments and the communities that inhabit them.

The graphical evolution from static, singular form to a more complex and dynamic representation of urban space underscores the film’s thematic focus on change, adaptation, the ongoing processes of urban redevelopment, and the people’s agency from the shadows. The film does not dictate. Instead, premised on “the realization that we do not yet know what we don’t know,”⁶ it allows viewers time and space to ‘figure things out,’ such as storylines, historical connections, and networks. For some and those still waiting to know, the film’s purpose may feel unclear or delayed, potentially until everything makes sense.

At times, having to deal with the unknown and a lack of understanding – literally, the language used – is a central element in the composition of the piece. In doing so, the film simulates life [as lived]. However, in this instance, it is a carefully curated experience of seeing and listening as a way to observe the city, especially conflicts that emerge between spaces imagined and designed by Euro-centric

practitioners and 21st-century urban African users. In particular, insurgent entrepreneurs who make up a significant, service-centered sub-economy.

Methodological Approach

The methodology responds to calls by literary and spatial theorists like Klaske Havik,⁷ Achille Mbembe⁸ and Leonie Sandercock.⁹ The scholars advocate for a new narrative analysis that recalibrates close reading and interpretation of the multiple ways in which narratives “do things” – how they intervene in the world and influence everyday life. As such, the approach fosters imaginative reflection of spatial and temporal scenarios relevant to a particular context, the Global South, but potentially applicable and relevant elsewhere where similar spatial and societal marginality exists. It addresses the realities of migration and changing values, cultures, and economies challenging established normative processes.

The following text guides the approach step-by-step. Its script references and is based on the tree on the sidewalk in Alexandria (Figure 2) and its people over time.

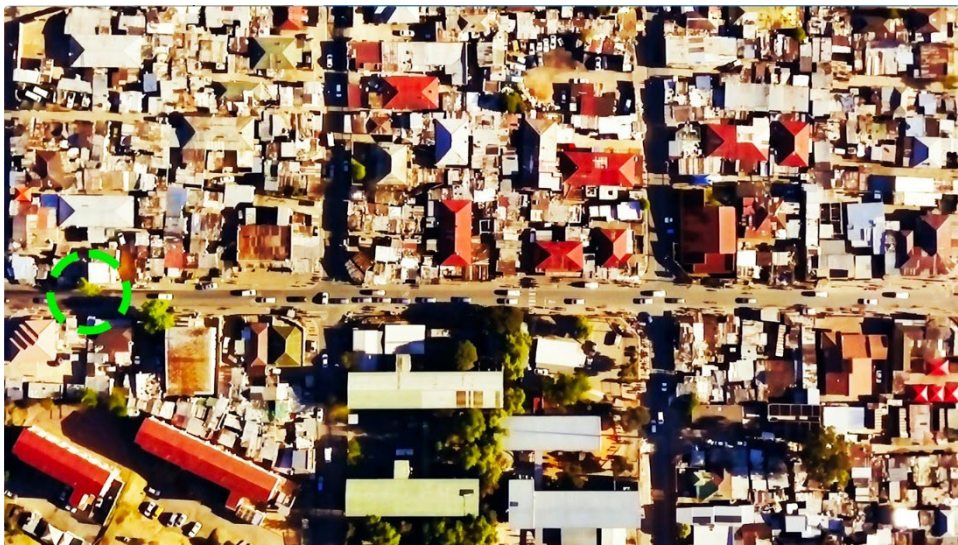


Figure 2. Aerial View of a Tree on a sidewalk in Alexandria along Rev Sam Buti Street, 1:12:03

BACKGROUND: SITUATING A NEW LANGUAGE

Havik et al. argue that today’s context presents new challenges for spatial practice, including inadequate planning and design tools.¹⁰ Henk Borgdorff claims that understanding and discovering city life is “more directed at a not-knowing, or not-yet-knowing, creating room for that which is unthought, that which is unexpected – the idea that all things could be different.”¹¹

The Frame as Structure

Urban Scripting responds with a semiotic structure and language to imagine, see, and convey the city’s making. This multi-dimensional semiotic system provides signposts and access codes to multiple authors’ tapestries at different scales of relevance to the new complexities in multicultural societies. Everyday life is documented, with imagined extensions guiding spatial practice. Sandercock’s theory, expounded in *Cosmopolis II*, reimagines the city’s unrepresentable space as valid life forms, uses story as a language, translates these spaces into narratives, and ultimately transforms them into places. Story and narration exist through the intermediary of the narrative as process and structure and develop as discourse by framing recounts.

Urban Scripting remakes the contemporary city and its architectures by engaging *the frame* as a conceptual, practical, and theoretical device to capture narratives in response to the challenge.

Transdisciplinary

Audio-visual storytelling establishes a transdisciplinary site reading process and consequent assessment protocol in landscapes of extreme socio-spatial complexity, contingency, and emergent insurgency. Conventional methods interweaved with speculative experiments and improvisation uncover the necessity for ‘other’ knowledge to reflect on making and theorizing the city. This intermingling shows that for cities to perform and accommodate ‘us’ as a complex collective of people and things¹² requires two fundamental things: one, improved urban situations for sidelined communities, and two, recognition of an assemblage of differences as unrealized possibilities. Johannesburg, one of the most unequal cities in the world, is a case study to explore the city from the margins.

The Twilight Zone

The conceptual focus is thus character-driven and defined by people and place. This abstraction emphasizes a central character termed *the twilight zone*. It argues for the assessment of the grey area of the informal and unknown and the legally regulated from alternate viewpoints, specifically the overlooked subaltern. As explained, these are spaces designed to be inhabitable in a ‘traditional’ way but recreated daily by and for the *Others* due to circumstances for their daily enterprise. Intersecting documentary with the imaginary, life [as lived] in the city is captured within a frame. The frame takes the form of story production.

Combining narrative and picture theory as a reading protocol produces documentary outputs that situate the story and the storyteller’s voices in everyday life and interrogates the image’s ability to grant insight into emergent phenomena. By recognizing and including these phenomena in spatial planning, practitioners can contribute to creating inclusive and efficient designs.

Analytical Framework

This way of writing with pictures (in comic style), inspired by Loseke’s theory, involves elements of time, context, and activities. *Framing* (time) emphasizes transdisciplinary measures. It looks at past events and why they transpired and asks what city-making tools fit and do not fit the purpose. It revisits yesterday to examine the strategies that led to today’s Johannesburg. *Shifting* (context) underscores the need for more critical and empirical-based exploration that inductively leads to novel ways of thinking and analyzing. It looks at what happens in the present and why and probes what constitutes conceiving and creating a city. *Shifting* stages today’s reality as influenced by yesterday’s impacts. *Positioning* (activities) highlights the validity of knowledge exchange, looks at what could happen if frames change in the (near) future, and explores what a just city is. It projects the possibilities of tomorrow informed by today.

In combination, the three develop a sensory framework that assembles nonlinear sequences of events that encompass past, present, and potential future occurrences and generate a composite overview of site and its potential, referred to as *calibrating*. *Calibrating* comprises all tripartite steps over time, based on the practice of storytelling. The assemblage of these elements situates a language that aids Africans in recognizing their value, reclaiming their voice, and finding their own way forward.

KEY ACTIONS: FRAMING, SHIFTING, POSITIONING

Framing engages time and integrates different disciplines to make new knowledge. This knowledge considers past events to understand the present and asks what thinking – and making – tools are needed to create a city. *Shifting* utilizes experiential methods and active listening to think through and analyze

the landscape. *Positioning* employs activities that emphasize the importance of knowledge exchange and examines the potential impact of changing current perspectives. *Calibrating* through storytelling brings the three steps together and helps to [re]present the past and [re]imagine the present to create future hybrid urban spaces. The movements structure a critical-reading protocol from macro, meso, and micro levels (see Figure 3).

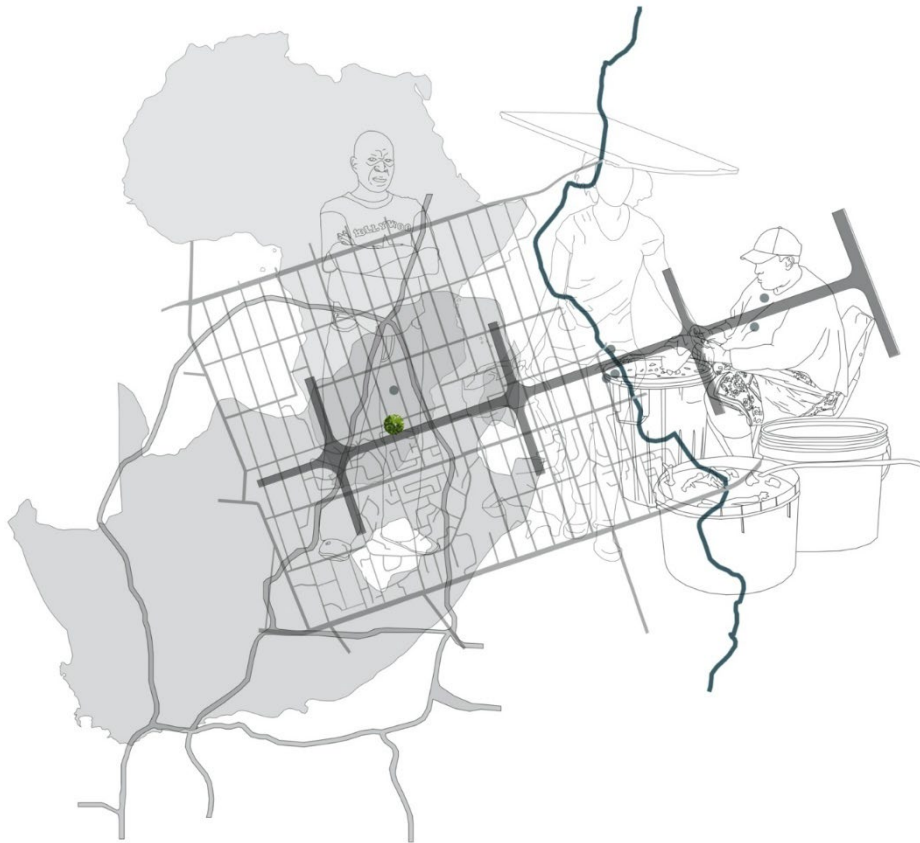


Figure 3. Urban Scripting Scales – Macro, Meso, Micro

Framing

Framing reads the city's history. It historicizes Johannesburg by engaging and employing time to indicate notable events, such as the discovery of the gold that created the city. In addition to time, framing engages with apartheid laws to read, reimagine, and recreate hybrid urban spaces within relevant timeframes. The story employs these five policies as narrative markers:

1. The Land Act of 1913 limits Black people, who are the majority, from owning more than 8% of the land and essentially prohibits land sales between races.
2. The Urban Areas Act of 1923 restricts Black access to the city, which is only permitted for white servitude through “influx controls” and passes.
3. The Native Trust and Land Act of 1936 (later the Bantu Trust and Land Act and Development Trust and Land Act) formally separates white and Black rural areas and increases the percentage allocated to the Nguni to 13.6%, a proportion never reached.
4. The Group Areas Act of 1950 permits the government to segregate land occupation, designating certain geographic areas for use by a single race.

5. The Bantu Education Act of 1953 enables the regime to structure Nguni education separately from Whites.

Politics of Marginalization

Philip Harrison et al. find that racial segregation in South Africa can be traced back to nineteenth-century British rule.¹³ A common practice of allocating land exclusively for non-whites around larger urban settlements was first established in Port Elizabeth in the 1850s in ‘native locations.’ However, this right “to own or rent land outside of defined rural ‘reserves’ (or homelands)”¹⁴ ceased in 1913 with the introduction of the Land Act. It was implemented to regulate land acquisition in South Africa and had a profound impact on African traditionalism by restricting Black land ownership to just 8% of the country’s surface area. It also prohibited the sale of land from whites to blacks and vice versa, thus making it extremely difficult for black people to own land.

The Land Act of 1913 also prohibited Nguni people from living on farms except as servants working for white people, mostly farmers. The thousands of Ngunis (and other indigenous groups) who fell outside those permitted to remain were forced to leave almost immediately and either resettle in their ‘tribal’ areas or find a landowner who could employ them and obtain a permit for them. The act restricted all ownership in the newly formed areas to the races designated to reside there. Post-1948, Apartheid legislation of the official formal adoption of separate development barred Blacks from doing business in white areas. Yet, whites and government agencies, exempt from their own policies, could and did continue to own much of the land in designated Black areas.

Excluding the black population from most of their ancestral arable and pastoral land forced them to relocate to industrial dormitory-type areas as wage labor. Consequently, the Natives (Urban Areas) Act of 1923 designated urban areas as exclusively white and required all Black people, especially African men, to always carry permits, called *dompas* (dumb pass), with them. This act enforced and served as an influx control limiting Black access to white cities.

Spatial Footprint: Creating the Urban Twilight Zone

The various acts outlined essentially created a stilted urban spatial footprint based on racial segregation. Nguni population groups were only allowed in the cities if they were in possession of a pass and forced indoors at night by curfews if they were entitled to reside in white-only areas. They were otherwise confined to designated areas, known as homelands, which were eventually declared ‘independent’ Bantustans.

Subsequently, the Group Areas Act of 1950 extended the Urban Areas Act. The Afrikaner Nationalist Party, which came into power on an election ticket of apartheid in 1948, based on the idea of white supremacy, divided the country into areas based on different racial categories. Also passed in 1950, the Population Registration Act provided the definitions for the racial categories: native (Black or Bantu), Coloured (people of mixed race), white, and Asian (also called Indian), which was added later. The fundamental purpose of the Group Areas Act was to permit the state to dictate where races could and could not live.

Authorities had the legislative power to force Blacks, who were living in what were white-desirable settings, out of these areas. Most importantly, it provided the mechanism necessary to take Black people’s land for white socioeconomic interests forcibly.

Legislated in 1953, the Bantu Education Act gave the government the authority to organize and regulate the education of Nguni (native) children separately from white children. This law also introduced a standardized curriculum that prioritized Bantu culture and taught only those subjects that would benefit the government’s objectives, such as preparing Black students for menial work in offices, factories, and other service structures. The creation of the Bantustans was based on the legislation contained in the

Land Acts of 1923 and 1936, which granted the white minority a quasi-democratic majority in the land allocated to them by classifying the Nguni majority as foreign. This is because Black people lost their South African citizenship and any voting rights following the passing of the Promotion of Bantu Self-Government Act of 1959 and the Bantu Homelands Citizenship Act of 1970, allowing whites to remain in control.

Thus, in less than a hundred years since the discovery of gold created Johannesburg, any Nguni descendant of the area was now essentially officially considered, if adequately documented and permitted, a foreigner or, if not, an illegal resident/immigrant.

Emergence of the Twilight Zone

While many other apartheid segregationist policies demeaned and reduced the Nguni, the laws identified had the most significant influence in creating *the twilight zone*. This is portrayed in the film when protagonist Rachel Nditjeni recalls the activities she had access to after school under apartheid laws (Figure 4). The moving frame acknowledges and emphasizes coproduction forms of situated knowledge, documents everyday street-level perspective, and its imagined extension acts as a beacon to guide informed planning practice.

The awareness – premised on the concept that if spatial practice cannot see or name the problem, it can neither study nor address it – of this need to understand the street is foundational to the image-making process. Reading the ground and listening to people in this manner initiates a sense of *ubuntu*¹⁵ underpinned by an onto-epistemology reiteration that “every view is a view from somewhere and every act of speaking a speaking from somewhere.”¹⁶



Figure 4. Rachel: “When you can’t do the big business, you start with the tomato and go and sell house to house...” 1:08:54:06

Shifting

Shifting context unveils segments of the city through meticulous forensic documentation of the street at various scales and mediums. According to Jeffrey Hou, “Understanding the significance and characteristics of unsanctioned and unscripted spatial practices is an important step in comprehending the full complexity of a wide variety of actors and processes – some formal, some not.”¹⁷ As previously observed, many of these actors and their processes operate without formal recognition or support. They exist in their work in *the twilight zone*. Acknowledging the actors’ practices and methods, as identified

by Hou and drawing on their subaltern knowledge, is a call that responds to the challenges encountered when measuring and understanding the twilight zone's vibrant insurgency.

Closing the Gap

A sign of the knowledge gap that separates *the twilight zone* from elite institutions (the academy and practice) is Achille Mbembe and Sarah Nuttall describing Johannesburg as the *Elusive Metropolis* by pointing “to the gap between the way things actually are and the way they appear in theory and discourse.”¹⁸ Making the moving image expresses closing the gap between reality (the way things are) and as a framework for understanding, knowledge sharing, communication and representation that constructs our world experience and shapes our worldview (theoretical discourse).

In making the moving image, the scriptor narrows the gap between reality (the way things are) and outdated perception inherited from elsewhere and expresses colonial sense-making. Therefore, image creation is a framework for understanding, knowledge sharing, communication and representation. Its making process constructs a common world experience and shapes a more rounded and relevant worldview (theoretical discourse). The art of making – memorializing – acknowledges, amongst many other things, urban marginality, ingenuity, and the aesthetic of liminal spaces.

Frames and their sequences create urban spaces as place-making, each with identities rooted in a local, cultural, and historical context. Premised on Asef Bayat's “quiet encroachment of the ordinary”¹⁹ being critical to the street and, by extension, the city's ecosystem, *the twilight zone* operates in interstitial, liminal, *Othered* arenas that need recognition, and which are duly recognized and illustrated through the *Urban Scripting* framing action.

Representing Local Forms

The filmic (and written) text, depicted in the frame and sequences, highlights Bayat's concept of the subtle and enduring ways the impoverished strive to survive and improve their lives by gradually encroaching upon the wealthy and influential and society as a whole. Their ‘ordinary’ struggle deserves recognition, knowledge sharing, and support from spatial discipline to help create new local landscapes. These landscapes, characterized by forms of guerrilla urbanism, should “reflect the community's specific social settings and issues,”²⁰ such as Rachel's chicken business on Rev. Sam Buti Street (Figure 5).

Terms like “spaces of insurgent citizenship,”²¹ ‘invented spaces of citizenship,’²² and “grey spaces”²³ describe this new landscape. Faranak Miraftab refers to these as “‘invented’ spaces defined by collective actions” of low-income people and people experiencing poverty “that directly confront the authorities and challenge the status quo.”²⁴



Figure 5. Guerilla urbanism: Chicken business, 1:08:56:12

Positioning

Positioning focuses on what Arjun Appadurai refers to as the condition of “temporariness” that the subaltern faces and addresses it through knowledge exchange that deals with “... social, political, and moral relations and relations to the sources of power.”²⁵ In the contemporary city, as a tool to promote the essential elements to address “the condition of temporariness” by “creating locality,”²⁶ highlighting *the twilight zone* conveys systems of ‘tactical urbanism,’²⁷ expresses ‘practices of resistance,’²⁸ and responds to the call calls for new and unorthodox assessment methods if “the potentialities of our moment are to be seized in full.”²⁹

Due to a lack of capital and property rights, *twilight zone* microentrepreneurs are flexible, adaptable, and innovative in their work and are good at maximizing the potential they can access. This elastic strength is bricolage:

“a process whereby entrepreneurs with local knowledge and access to local resources are best able to create enterprises using the materials at hand, rather than overextending their efforts with externally directed attributes requiring unattainable resources. As such, entrepreneurial process elements may be emulated from successful social bricolage examples, recognizing that each context, community, and circumstances will require their own unique solutions.”³⁰

Producer

When making the city, expressed here through the moving image, the urban designer as scriptor/producer aims to develop ‘their own’ creative and operational bricolage potential and respond to changing engagement and environmental conditions by optimizing the story/image gathering and disseminating process. As Hou argues, at the practical level, a deeper comprehension of the twilight zone enables us to better participate in, react to, and exploit these emergent practices for transformative spatial development results.

Viewpoints

In the twilight film, the camera sweeps across the landscape, revealing the bustling interplay of small businesses, homes, and the people who navigate the streets, their movements intertwined with the vehicles that share this space. The cinematography alternates between sweeping bird’s-eye views and kinetic tracking shots, mapping out the street as the sun gradually dips, marking the passage of time.

This montage sets the spatial stage for the film's exploration and roots the narrative in a place that shapes its characters. It gives the audience a visual foundation for the personal stories that will soon unfold.

Perspectives

The use of a drone provides an almost ethereal perspective of Alexandra—one that most of us will never experience firsthand. It allows viewers to see the community's layout and density from above and offers a fresh appreciation for the relationship between the physical space and its inhabitants. The cinematography's rhythm—shifting between distant, panoramic shots and closer, more immediate views—creates a dynamic contrast. The aerial shots offer a detached, almost omniscient perspective. In contrast, the ground-level tracking shots pull the observer back into the daily life of the community, immersing them in the details that make up the fabric of street life. This interplay of distance and proximity adds a layer of complexity to the visual storytelling that keeps the viewer engaged and invested.

Timeshifts

The film's first significant shift comes when Bra Niky takes on the role of narrator, and with it, the medium transitions from live-action to animation – a stark departure from what we've seen so far, as illustrated in Figure 1. The animation, rendered in stark black and white, evokes a nostalgic nod to Hanna-Barbera³¹ cartoons of the mid 20th-century. These were the kind of animations where backgrounds were simple, often static, drawing the viewer's attention to the characters and their exaggerated, stylized movements. It's a choice that feels (and is) deliberate, emphasizing symbolism over realism, as the sequence begins with Niky standing by a tree on a sidewalk before transporting us back to the 1800s.

Coproduction

Urban Scripting in the twilight zone entails a multilayer coproduction. Multiple voices and writing forms unlock the imaginaries that feed the city's twilight zones, including non-conventional disciplines. The spatial practitioner uses his expertise to frame the context as a knowledge source in the making. This awareness-creation assists narrators and makers in enhancing communication structures premised on bridging knowledge gaps, resulting in better capture and [re]presentation of imaginaries and the real.

CONCLUSION

Urban Scripting places audio-visual recordings of the existing situation in a pivotal position, developing an urban methodology rooted in Africa that gives voice to those inhabiting the streets as public space for social and livelihood activities. Transdisciplinary methods structure more critical and empirically on-ground evidence that inductively leads to new ways of thinking and analyzing. Practice-based casework turns space into place, builds an anthology of empirical knowledge to inform city-making methodologies, and shapes appropriate policies that support subaltern communities. Programmatically and polemically, it explores how a cinematic frame is an inclusive tool within a specific set of urban processes. Ultimately, its enframing application calibrates an empathetic narrative, potentially transforming lives positively and progressively for an African city in motion. This approach is valuable for practitioners as a firm departure from convention and thrusts Black African knowledge to the forefront, thus acting as a decolonization tool.

NOTES

- ¹ Donileen R. Loseke, *Narrative as Topic and Method in Social Research* (Thousand Oaks: SAGE Publication, Inc. 2022), xiii.
- ² Solam Mkhabela, *The Twilight Zone* (Johannesburg, 2024)
- ³ Donileen R. Loseke, *Narrative as Topic and Method in Social Research* (Thousand Oaks: SAGE Publication, Inc. 2022), xiii.
- ⁴ The animation draws inspiration from Hanna-Barbera, who played a crucial role in developing a technique called limited animation. Their technique made television animation more cost-effective, although it often reduced quality.
- ⁵ The storywork has been produced as part of the PhD research *Urban Scripting, Audio-visual Forms of Storytelling in Urban Design and Planning: The Case of Two Activity Streets in Johannesburg* (Mkhabela 2023). *I'm a Streetwalker* (2017), Film. Script: Solam Mkhabela, Access + Logistics: Ronny Ndhlovu, Drone Pilot: Ross Maxwell, Voice-Over: Andrea Rolfes, Voice Recording: Jurgen Meekel, Editor: Solam Mkhabela. Final Mix: Jurgen Meekel. *The block, the plot, the house, the tree* (2019). Animation. Script: Solam Mkhabela, Internal Expert: Bra Niky, Voice-Over: Bra Niky, Thando Hopa, Studio Recording: Stephen Kirker, Field Audio: Solam Mkhabela, Band A Part, Visualization: Tshimologong Mollo Animation Academy & Studio, the film *There's a tree on the sidewalk* (2018). Film. Story: Bra Niky, Solam Mkhabela, Location: Solam Mkhabela, Internal Experts: Bra Niky, Bra Sam, Rachel, Joyce, Paddy, Vivian, Audio: Hainbach, Isaac (Bra Zacks) Nkosi, Visualization: Band A Part.
- ⁶ Henk Borgdorff, "The Production of Knowledge in Artistic Research," in Michale Biggs & Henrik Karlsson, eds. *The Routledge Companion to Research in the Arts* (London: Routledge, 2010), 61.
- ⁷ Klaske Havik, *Urban Literacy: A Scripting Approach to the Experience, Use, and Imagination of Place*. (Delft: TUDelft, 2012)
- ⁸ Achille Mbembe, *On the Postcolony* (Johannesburg: Wits University Press. 2015)
- ⁹ Leonie Sandercock, *Cosmopolis II: Mongrel Cities in the 21st Century* (New York: Continuum, 2003b)
- ¹⁰ Klaske Havik, Bruno Notteboom and Saskia de Wit, Saskia, "Narrating Urban Landscapes," *Journal for Architecture, Issue Narrating Urban Landscapes*, (OASE#98, 2017): 1—6.
- ¹¹ Henk Borgdorff, "The Production of Knowledge in Artistic Research," in Michale Biggs & Henrik Karlsson, eds. *The Routledge Companion to Research in the Arts* (London: Routledge, 2010), 61.
- ¹² Leoni Sandercock, "When Strangers Become Neighbours: Managing Cities of Difference," in *Planning Theory & Practice*, 1(1), (2000): 13—30.
- ¹³ Philip Harrison, Alison Todes and Vanessa Watson, *Planning and Transformation: Learning from the post-apartheid experience* (London: Routledge, 2007)
- ¹⁴ Philip Harrison, Alison Todes and Vanessa Watson, *Planning and Transformation: Learning from the post-apartheid experience* (London: Routledge, 2007), 6.
- ¹⁵ The Nguni have a saying, *umuntu ngumuntu ngabantu*, a humanist philosophical term that translates to a person being a person because of their connection to others. Phrased differently, it means *I am because we are*. It is also commonly referred to simply as *Ubuntu*. For richer access, see Desmond Tutu (2013) discussing this concept of "*Who we are: Human uniqueness and the African spirit of Ubuntu*," accessed October 3, 2019, <https://www.youtube.com/watch?v=ftjdDOFTzkb>.
- ¹⁶ Lila Abu-Lughod, "Writing against Culture," in T. S. Oakes & P. L. Price, eds. *The Cultural Geography Reader*, (London: Routledge, 2008), 53.
- ¹⁷ Jeffrey Hou, "Guerrilla urbanism: urban design and the practices of resistance," 2020:123, accessed 26 January 26, 2022, <https://link.springer.com/article/10.1057/s41289-020-00118-6>.
- ¹⁸ Achille Mbembe and Sarah Nuttall, "Introduction: Afropolis," in Sarah Nuttall & Achille Mbembe, eds. *Johannesburg: The Elusive Metropolis*, (Johannesburg: Wits University Press, 2008), 25.
- ¹⁹ Asef Bayat, *Life as Politics. How Ordinary People Change the Middle East*, (Amsterdam: Amsterdam University Press, 2010:14), <https://scholarlypublications.universiteitleiden.nl/handle/1887/15229>
- ²⁰ Jeffrey Hou, Jeffrey, "(Not) your everyday public space," in Jeffrey Hou, ed. *Insurgent Public Space*, (London and New York: Routledge, 2010), 2.
- ²¹ James Holston, "Spaces of Insurgent Citizenship," in Leonie Sandercock, ed. *Making the Invisible Visible: A Multicultural Planning History*, (Berkely and Los Angeles: University of California Press, 2017), 37.
- ²² Faranak Miraftab, "Invited and Invented Spaces of Participation: Neoliberal Citizenship and Feminists' Expanded Notion of Politics," 2004, accessed February 17, 2020, <http://www.rrojasdatabank.info/neolibstate/miraftab.pdf>

- ²³ Oren Yiftachel, "Critical theory and "gray space": mobilization of the colonized," in Neil Brenner, Peter Marcuse & Margit Mayer, eds. *Cities for People, Not for Profit: Critical Urban Theory and the Right to the City* (London: Routledge, 2011): 150—170.
- ²⁴ Faranak Miraftab, "Insurgent Planning: Situating Radical Planning in the Global South," *Planning Theory*, 8(31), (2009): 38—39.
- ²⁵ Arjun Appadurai, "Illusion of Permanence," Interview with Arjun Appadurai by Perspecta 43. *Perspecta*, Volume 34, (2003), 47.
- ²⁶ Arjun Appadurai, "Illusion of Permanence," Interview with Arjun Appadurai by Perspecta 43. *Perspecta*, Volume 34, (2003), 47.
- ²⁷ Mike Lydon and Anthony Garcia, *Tactical Urbanism: Short-term Action for Long-term Change*, (Washington: Island Press, 2015).
- ²⁸ Jeffrey Hou, "Guerrilla urbanism: urban design and the practices of resistance," 2020:123, accessed 26 January 26, 2022, <https://link.springer.com/article/10.1057/s41289-020-00118-6>.
- ²⁹ Edgar Pieterse, "Unlocking political potentialities," in Michele Lancione and Colin McFarlane, eds. *Thinking Global Urbanism: Essays on the City and its Future*, (London: Routledge, 2021): 193.
- ³⁰ Stephen B. Preece, "Social Bricolage in Arts Entrepreneurship: Building a Jazz Society from Scratch," *A Journal of Entrepreneurship in the Arts*, 3(1), (2014): 23.
- ³¹ Andrew Buncombe, "William Hanna, the cartoonist who transformed animation, dies aged 90," 2001, accessed August 17, 2024, <https://web.archive.org/web/20090703090151/http://www.independent.co.uk/arts-entertainment/films/news/william-hanna-the-cartoonist-who-transformed-animation-dies-aged-90-688796.html/>.

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RETHINKING WALKABILITY: DEVELOPING A SUSTAINABLE NEIGHBORHOOD THROUGH STREET CONNECTIVITY IN THE CONTEXT OF DHAKA CITY.

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INTRODUCTION

Mega City Dhaka has a population of 8.907 million people (about 18.237 million in greater Dhaka), which has been growing at an astonishing rate since the independence, with a density of 23,234 people per square kilometer within a total area of 300 square kilometers.¹ Walkability and street connectivity is an essential aspect for urban sustainability to make a city livable. The study aims to evaluate the evolution of the rapid urbanization of the city of Dhaka, and its relationship with street connectivity, and accessibility using walkability index, and space syntax. Walkability index has been implemented to measure the three aspects of land-use-mix, dwelling density, access to public transport, and Space Syntax analysis was used to interpret street connectivity with Depth map program. In this study Dhaka's major road network where the station of Farmgate of the mass rapid transit (MRT) line 06 is taken as case study, to assess the street connectivity patterns influencing walkability which connects the major commercial areas. The findings suggest that additional factors beside connectivity such as the availability of supporting amenities and the proximity of the land use mix and the dwelling density of the activity center might make the public transits more accessible. The results suggest that there is a significant association between walkability and street connectivity, therefore, it should be considered to develop a livable city. Thus, it is crucial to promote a walkable neighborhood where the inhabitants of a city are offered a sustainable walking environment.

Literature Review

Major built-up area in the DCC area in the early 1970s still occupied the core city, but also expanded beyond the old city limits. In the period between 1972 and 1980, the built-up area in the DCC area clearly headed towards the west and north of the existing growth center (Figure 1). The total built-up area had by this time increased by 72%, while the population in the DCC areas increased to 3,248,000, with a net growth rate of 120%.² Later population growth slowed down, Dhaka's population doubled in size from 3,248,000 in 1980 to 6,619,000 in 1990, with an estimated population growth rate of 104%.³ and a built-up growth rate of 46% during the same period.

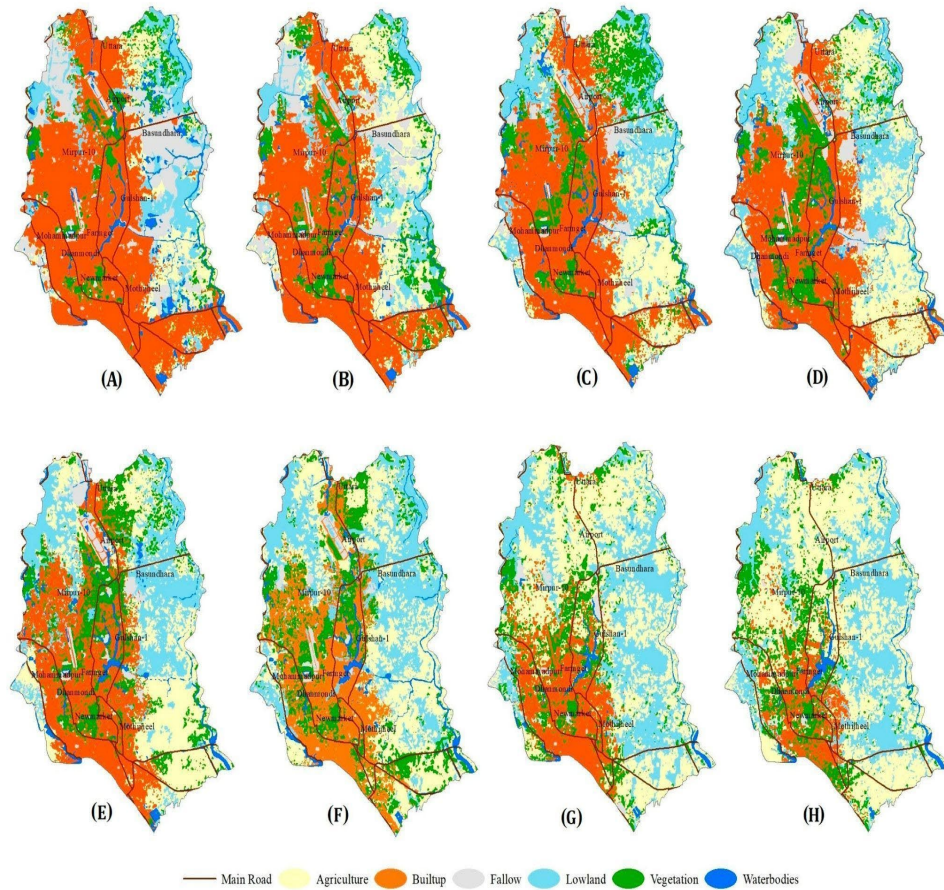


Figure 1. Urban expansion map of the Core city/Dhaka City Corporation area (DCC) between 1972 and 2015. (A) 2015; (B) 2010; (C) 2005; (D) 2000; (E) 1995; (F) 1990; (G) 1980; (H) 1972. ⁴

Site Location and Characteristics

The site is located between the two busiest roads of the city, which links the east and west sector of Dhaka (Figure 2). On the west end there is the Manik Mia Avenue and Begum Rokeya Avenue and on the east end there is the Kazi Nazrul Islam Avenue (Old Airport Road). The Sher-E-Bangla Nagar Park is one of the few remaining accessible green places in Dhaka which is beside the site. The National Parliament building is located on the northwest corner of the site. As Farmgate is one of the most important transitional points in Dhaka city, the site is quite suitable for the construction of a Metro station.


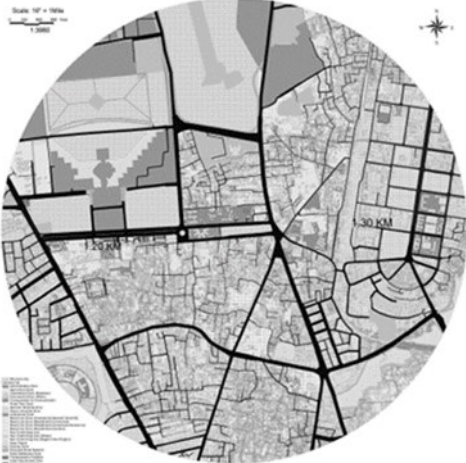
Location	Google map (Bangladesh)	Study Area (Site)
Farmgate, Dhaka, Bangladesh		

Figure 2. Site location. Source: Author & RAJUK

Farmgate Existing Public Walkability and Transport:

Forming walkable cities is a means to build equitable and economical transportation options for the entire urban population.⁵ The ability to walk safely and comfortably in an urban environment has been referred to as walkability. Despite having wide (around 10') pedestrian areas, the area is bustling with foot traffic. A bus stop with one-way service is located on the north-east side. Additionally, there is a modal switch from rickshaw to bus or tempo, which mostly happens on the south side of the site, when people traveling from nearby neighborhoods arrive by rickshaw or leguna and then board a bus or other vehicle to travel to other areas of the city. Passengers from various parts of the city disembark here to go to the surrounding prestigious educational institutions or residential areas, or vice versa. There are four pedestrian elevated walkways/bridges on the east side of the site that connect the end of Kazi Nazrul Islam Avenue to another and are always used heavily by walkers due to the constant strong vehicular traffic on the road below.

People from all around the city gather here for recreational purposes because of the Parliament Assembly Building's green space. The green roundabout on the west end has become a very local favorite for the natives over the years, and it becomes very busy in the evenings.

Land Use Pattern of Farmgate Area

Farmgate, one of the major city centers, comprises dense urban fabric. The mixed use and residential development are prominent in this area (Figure 3). Besides, the governmental offices and community services are also situated near the expected location of MRT station. Also, the site houses several school, college and coaching centers. A diverse combination of formal and informal land uses draws visitors of all ages to the area around the station.



Figure 3. Existing height variation of the built form at farmgate area (Source: RAJUK & Author) and Existing formal land use pattern at farmgate area.⁶

Walkability Index

Walkability, defined as “the extent to which walking is readily available as a safe, connected, accessible and pleasant mode of transport”,⁷ is an important element in assessing urban sustainability. It not only benefits the economy, such as consumer savings through reduced vehicle use, public cost savings for transportation infrastructure, and cost savings from the improved land use efficiency, but also benefits sustainability in the environment and equity.⁸

According to Frank three components to construct a WI are: Net residential density, street connectivity, and land-use mix. Later, his team refined their walkability index by adding the fourth component: the retail floor area ratio.⁹ He defined net residential density as the ratio of residential units to the land area devoted to residential use per block group and the retail floor area ratio as the retail building floor area footprint divided by retail land floor area footprint.

- Street connectivity, reflecting the connectivity of the street network, was the ratio of the number of true intersections (three or more legs) to the land area of the block group in acres.
- He defined land-use mix as the diversity of five land use types, with 0 being single use and 1 indicating a completely even distribution of floor area across the five uses. Other researchers proposed adding transit access as an important aspect for walkability.

RESEARCH METHODOLOGY

A combination of objective and subjective methodologies were employed in this study. The questionnaire for physical activity (walking component) was used to investigate the amount of walking that people do over the course of a week which was a subjective method while the objective method was utilized to calculate Land-use Mix, Street connectivity, and housing density. Utilizing GIS software was the objective method used to determine the land use mix.¹⁰ Walkability has been increasingly emphasized as an important element of urban sustainability. We constructed a comprehensive walkability index that incorporates five components: net residential density, street connectivity, land-use mix, transit stops, and flatness. Relying on existing data mapping, we first evaluated urban land expansion to provide a background for our walkability percent.¹¹ We then conducted our walkability analysis on the area of our given case study. The approach entails

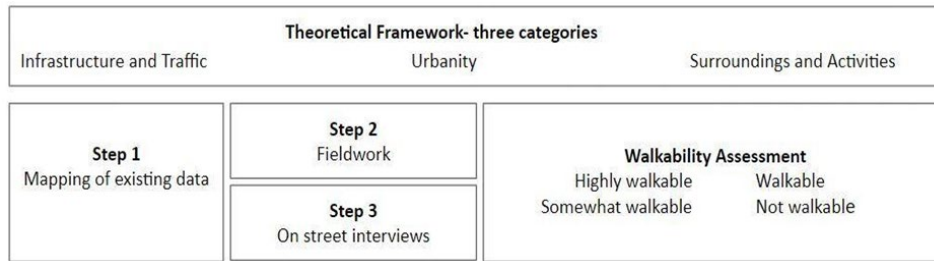


Table 1. Research framework for investigating walkability.¹²

The walkability index is the integrated index of the five aspects of the built environment: dwelling density, street connectivity, land-use mix, access to public transit, and elevation variation.

Detailed calculation of each sub-index

Street connectivity (SC): measured by the number of true intersections These variables are normalized into sub-indexes (valuing between 0–1), as following: $NRD\ Index\ (NRDI) = NRD / \max(NRD)$ (1)

$SC\ Index\ (SCI) = SC / \max(SC)$ (2)

Land-use mix (LUM): an indicator of the mixed level of six land use types of (1) residential, (2) commercial and office, (3) industrial, (4) institutional (e.g., schools, libraries, kindergartens), (5) green/park area, and (6) water and wetland;

$LUM\ Index\ (LUMI) = LUM / \max(LUM)$ (3)

where , $Land\ use\ mix\ (LUM) = (-1) * [(b1/A) \ln(b1/A) + (b2/A) \ln(b2/A) + (b3/A) \ln(b3/A)]$

Transit Stops (TS): measured by number of bus (BS) and subway/light rail stops (SLS) per 0.01 km²;

$Transit\ Stop\ Index\ (TSI) = 2/3\ SLSI + 1/3\ BSI$ (5)

Therefore , $Walkability\ Index\ (WI) = 1/7\ NRDI + 1/7\ SCI + 2/7\ LUMI + 2/7\ TSI + 1/7\ FLI$ (10)1

LIMITATIONS

Through enhancements and adaptations of the approach, some of the difficulties encountered while measuring and evaluating walkability in nodes with varying attributes and sizes can be mitigated. Particularly among planners and in planning practice, this runs counter to some of the suggested improvements and suggests that perhaps new strategies for both practice and research are required.

Planning should prioritize the needs of pedestrians when creating new nodes or significantly modifying or expanding existing ones. This includes constructing areas that encourage walking, such as streets rather than roads.

DATA COLLECTION

According to the survey (Figure 4), 7% of passersby either own or have access to a private car, 9% own a motorcycle, 12% have a bicycle, 25% use auto rickshaws, 32% take the local bus, and 15% walk to their nearby workplace. Also, the report indicates that 52% of the respondents use eco-friendly modes and 48% of them travel in vehicles that are detrimental to the environment. From the passerby’s perspective, the Local bus is an essential mode here by which people are going to their workplaces easily as it’s more accessible, and economical as well. However, the location of various transit modes is disorganized and in no way integrated. People must therefore move at random to use public transportation, often cross busy streets, and navigate packed urban pedestrian areas.

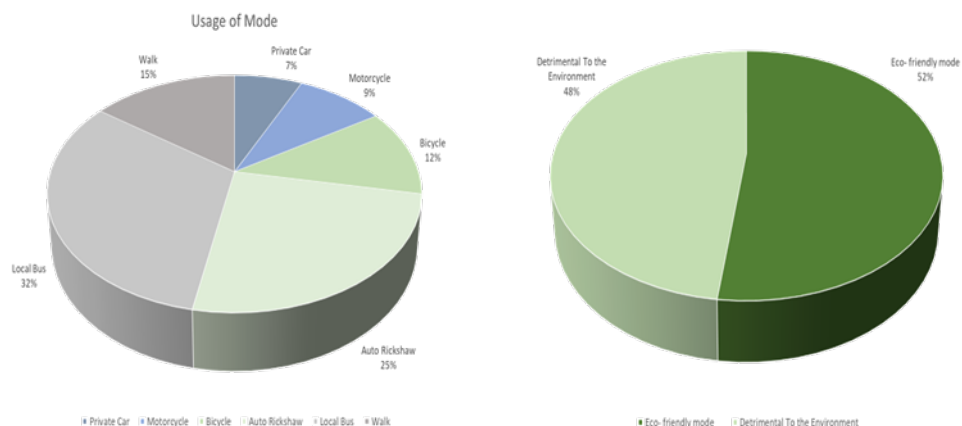


Figure 4. Usage of transportation modes and their impacts on the environment. Source: [Author]

This evaluation of Farmgate's current urban transportation infrastructure revealed significant problems, including ineffective regulatory frameworks, poor space allocation, an abundance of slow and low-capacity vehicles on major roads, ineffective traffic control, management, and enforcement, a lack of adequate public transportation, lack of recreational space, absence of appropriate pedestrian infrastructure, a poor connection between land use planning and transportation planning, and a lack of focus on ecologically friendly and sustainable transportation planning. Various surveys including observation survey, questionnaires, focus group discussion, mapping have been undertaken and their analysis revealed the following information (Figure 5).

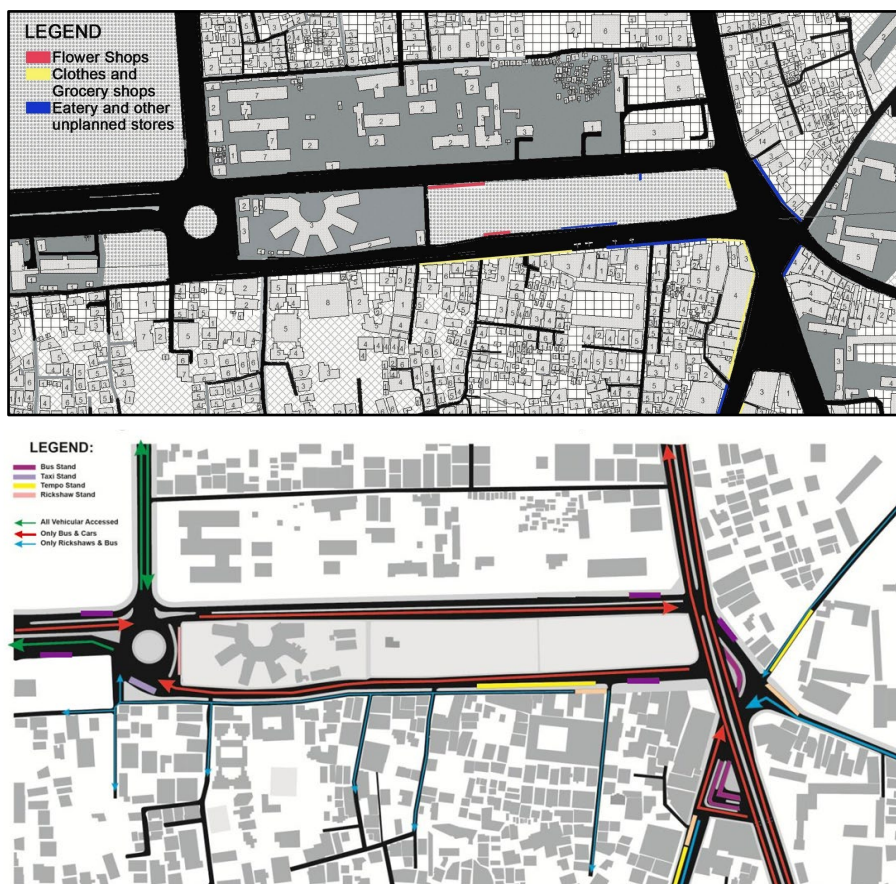


Figure 5. Existing informal land use pattern at farmgate area. Source: [Author] and Existing traffic and vehicular stops at the farmgate area. ¹³

RESULT AND DISCUSSION

Walkability

Farmgate has increased their walkability index from 2001 to 2021. However, great variations exist among the areas in terms of speed, scale, and locations of changes in walkability (Figure 6). When distributions of walkability index are compared (Figure. 6), that area had increased their portions of areas in ranges of higher walkability values.

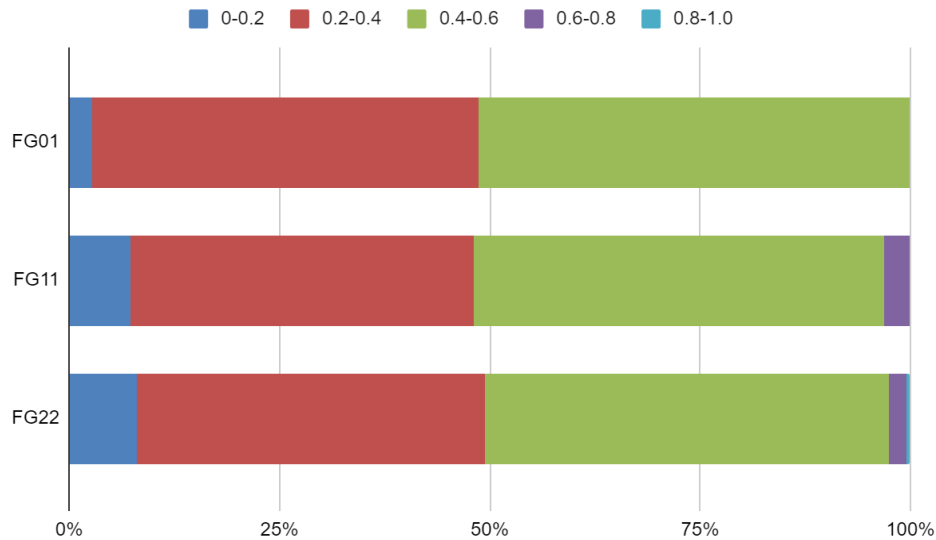


Figure 6. Walkability index distribution (%), where 2001 is indicated by “FG01”, 2011 is indicated by “FG11” and 2022 is indicated by “FG22” after the area’s name.

Moving towards the result and discussion, From the Figure 6, we can see that Walkability index from 2001 to 2022 and Figure 6 showing the Walkability index distribution (%), where 2001 is indicated by “FG01”, 2011 is indicated by “FG11” and 2022 is indicated by “FG22” after the area’s name.

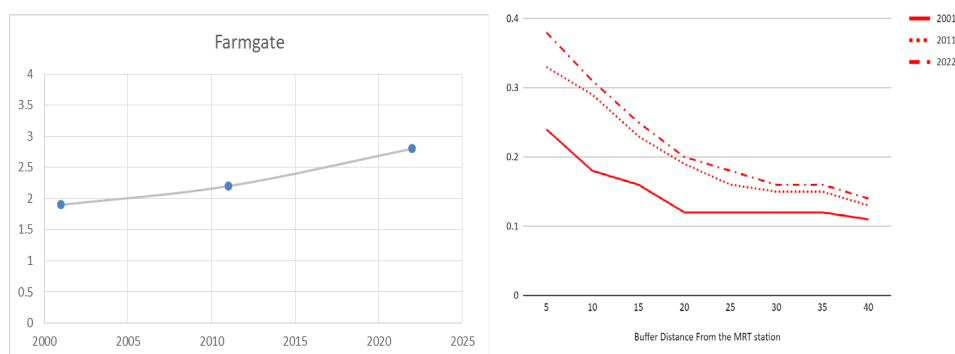


Figure 7. Change of walkability regarding buffer distance (radius) from the MRT station (Park). Note: We measured the average value of walkability in each of the 5 km buffer zones from the MRT station, respectively, in 2001, 2011 and 2022.

Figure 7, here, We measured the average value of walkability in each of the 5 km buffer zones from the MRT station (near the park), respectively, in 2001, 2011 and 2022. As can be observed, the walkability decreased from 5 to 40 kilometers from the MRT station, 0.24 to 0.11; 0.33 to 0.13; 0.38 to 0.14, respectively, in 2001, 2011 and 2022.

CONCLUSION

Urbanization has become more intensive in the last decade, as both urban land expansion and population increased more in 2001–2022 than in 1990–2000. MRT could contribute to the problem's solution and certainly aid in decreasing traffic congestion. The pre-study is carried out in an effort to identify a viable system that will combine the existing transportation network and urban mobility with MRT, also, besides discussing the context and anticipated advantages of the Mass Rapid Transit (MRT) system towards building the sustainable public transport system in Farmgate so that a significant portion of Dhaka City can have organized traffic movement.

The walkability index method developed in this paper can be widely adopted due to its comprehensiveness, simplicity, and flexibility. Our results on walkability can also improve the effectiveness of planning, as policy makers can strategically target the areas low in walkability index with a better understanding of what causes to consider.

RECOMMENDATION

A probable design framework has been established by considering the existing network and public interest through following issues.

Multilevel connection: In the suggested framework (Figure 8), various forms of transportation have been considered while taking into account Farmgate's current situation. Four elevated walkways have been added to encourage walkability to the east and west sides of Khamar Bari and Indira Roads, directing rickshaw stops and bus stops such that individuals can swiftly board the metro or depart the area, reducing traffic congestion to some extent.

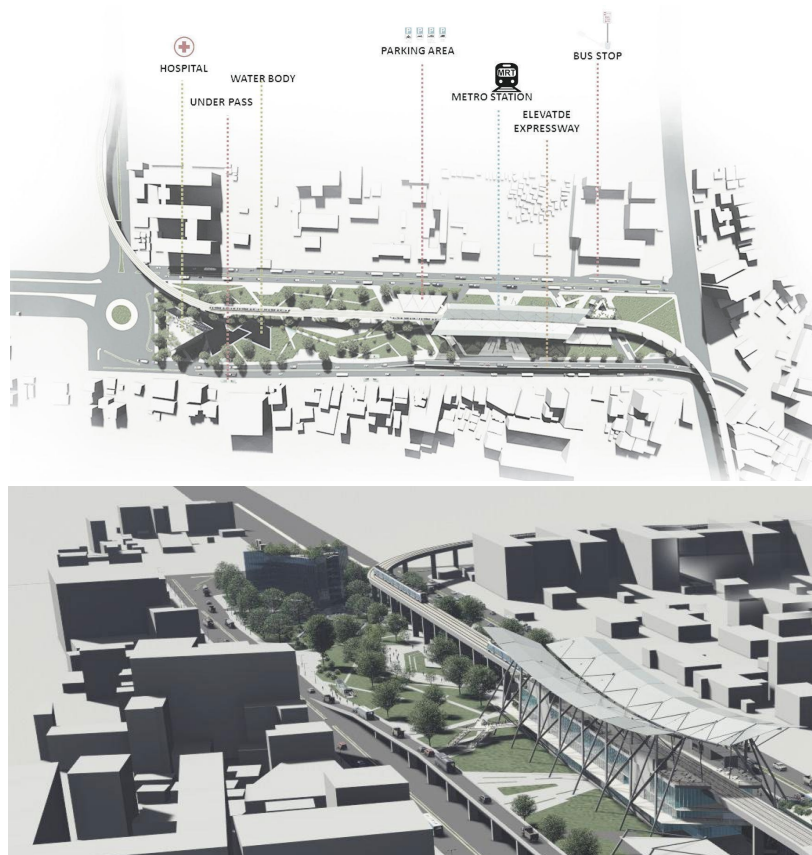


Figure 8. Proposed framework for the sustainable transport system design in farmgate. Source: [Author]

Integrated urban transit: The existence of restaurants, retail stores, and entertainment facilities will help to the farmgate area's vibrancy and liveliness, enhancing its desirability and raising its monetary value as well. The benefits of walkability on three fronts—health, livability, and sustainability—make it a fundamental component of urban design. Adopting walkability as an urban solution eases conceptual and practical tensions between the need to cut back on consumption based on transportation and the individualistic interests represented in the desire to own and utilize private cars as shown in (Figure 9).

Neighborhood enhancement: The introduction of a park as a recreational space with a variety of activities will play an essential role in making the neighborhood more walkable and will allow nearby residents as well as passersby to take a brief break from their hectic schedules while they wait for the metro or bus rapid transit to arrive.

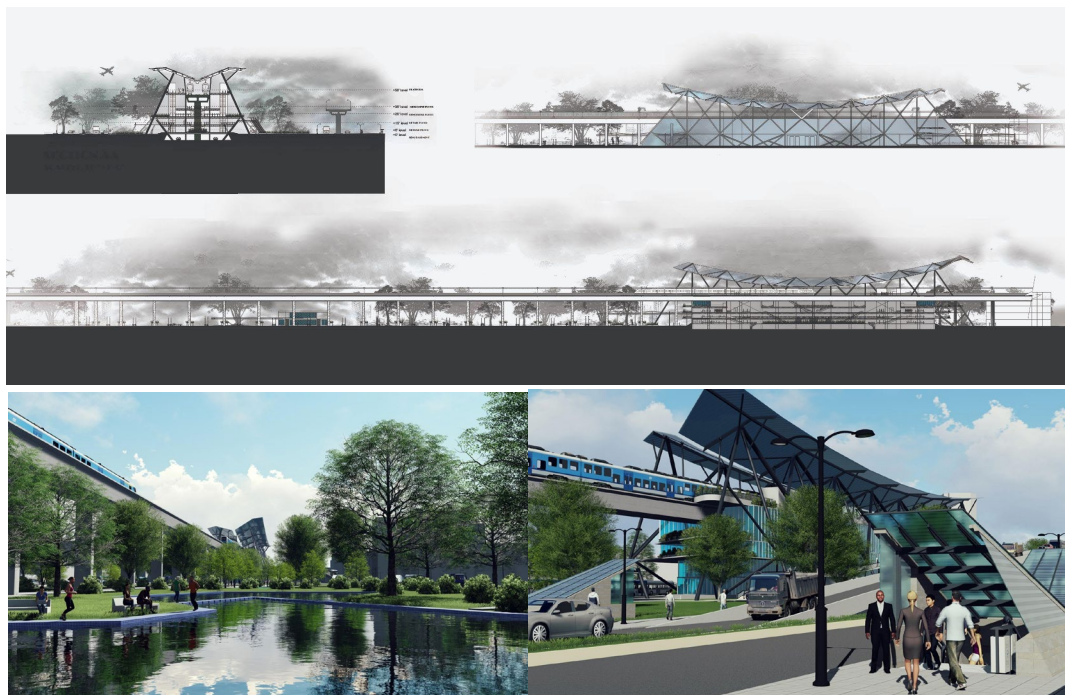


Figure 9. Proposed MRT station and Proposed park as recreational space near MRT station in farmgate. Source: [Author]

ACKNOWLEDGMENTS

The authors contributed equally to this work and are listed in alphabetical order.

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FACTORS DETRIMENTAL TO CITIZEN'S WILLINGNESS TO PARTICIPATION

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INTRODUCTION

Citizen participation is frequently hailed as a cornerstone of a functioning democracy. As Sherry R. Arnstein astutely observes, “the idea of citizen participation is a little like eating spinach: no one is against it in principle because it is good for you.”¹ Arnstein's metaphor underscores the widespread acknowledgment of the intrinsic value of involving citizens in the governance process. This foundational principle is not only a theoretical ideal but also a practical imperative, particularly in the context of addressing developmental challenges in the third world.

Global funding agencies, such as the World Bank, emphasize the significance of citizen engagement as a key driver of sustainable development. The World Bank defines citizen engagement as a ‘two-way interaction’ between citizens and governments or the private sector that gives citizens a stake in decision-making to improve development outcomes. This definition reflects the belief that active participation fosters more effective and enduring solutions to development challenges. The premise of citizen participation is straightforward: individuals should have the opportunity to engage in decisions that impact their lives. When provided with a platform, citizens are often willing and eager to participate, which in turn promotes development. However, despite research advancements, practitioners still face challenges in identifying interventions, governance models, and power dynamics necessary for citizen participation to achieve broader socioeconomic impact. Delving into when and how citizen engagement can be effective—and for whom—requires a nuanced examination of the underlying political and social inequities within a society. Therefore, exploring the factors influencing citizens' willingness to participate in governance remains a critical area of inquiry. This paper seeks to address these questions, shedding light on the conditions in which citizens are un/willing to participate in the urban water governance of the fast-growing Indian cities.

Theoretical Perspectives on Citizen Engagement

The dichotomy between intrinsic and instrumental citizen engagement has been a subject of significant scholarly debate. Intrinsic engagement refers to the idea that citizen participation is valuable in and of itself, independent of any external outcomes it might produce. This perspective is rooted in the belief that active participation in governance is a fundamental right and a key component of human development. Nobel laureate Amartya Sen is a prominent advocate of this view, arguing that citizen engagement is intrinsically valuable because it represents a critical aspect of human capability.

According to Sen, the ability to participate in decisions that affect one's life is not just a means to an end but an end in itself, reflecting the broader objectives of human freedom and empowerment.²

On the other hand, the instrumental perspective views citizen engagement as a tool to achieve specific development goals. From this viewpoint, participation is valuable primarily for the tangible benefits it can produce, such as better-targeted poverty alleviation programs or improved public service delivery. Mansuri and Rao, in their extensive work on participation, emphasize that citizen engagement is now increasingly seen through this lens. They argue that while participation can indeed lead to more equitable and effective development outcomes, its value is often assessed based on its ability to contribute to these goals rather than on its intrinsic merits.³

Several theoretical frameworks support the instrumental value of citizen engagement by highlighting its potential to enhance development outcomes. Asset-Based Community Development (ABCD) theory, for instance, posits that the active participation and empowerment of community members are crucial for their well-being. This approach emphasizes the importance of viewing community members as co-producers of their development, thereby aligning with the instrumental perspective that sees engagement as a means to achieve better development results.

Social capital theory furthers the instrumental benefits of citizen participation. It suggests that community engagement can enhance social capital by fostering trust, reciprocity, cooperation, and collective action among community members and stakeholders. By building strong networks of relationships within a community, engagement can lead to more cohesive and resilient societies, which are better equipped to address collective challenges.

Community organizing theory and dialogue and deliberation theory also offer insights into the instrumental value of citizen engagement. Community organizing theory highlights the role of negotiation in the engagement process, where diverse groups come together to articulate their needs and work towards common goals. Dialogue and deliberation theory, on the other hand, emphasizes how community engagement can facilitate constructive communication and decision-making among diverse and often conflicting perspectives. These theories illustrate how citizen engagement, when effectively facilitated, can lead to more inclusive and participatory governance processes, ultimately contributing to improved development outcomes.

LITERATURE REVIEW

Participation Typologies

Scholars like Langton have categorized citizen participation into four types: citizen action (e.g., protests, petitions), municipal government participation (e.g., public hearings, surveys), electoral participation (e.g., voting), and obligatory participation (e.g., tax payments).⁴ These categories highlight the varied ways citizens engage in governance, each impacting the democratic process differently. Another typology is Arnstein's ladder of participation, which categorizes participation into eight rungs, ranging from non-participation to citizen control. The lowest rungs represent decision-making without really involving citizens, whereas the highest represent when citizen engagement becomes an important part of the decision-making process.⁵ Developed in the 1960s, it reflects the era's systemic inequities, particularly in urban planning affecting Black communities in the U.S. While Arnstein argued that consultations diminish citizen agency,⁶ this view is now contested. Modern consultations are integral to decision-making, with citizens' input being seriously considered.

What are the spaces for participation?

The concept of citizen participation in urban governance is framed through 'invited' and 'created' spaces. Invited spaces involve formal mechanisms established by authorities seeking public input, often facilitated by NGOs, while created spaces are independently formed by citizen groups to address

specific issues outside institutional frameworks. Scholars advocate for bridging the gap between invited and created spaces to enhance participation. For example, Patel et al. note that in Ahmedabad, when invited spaces are denied, marginalized groups often mobilize through judicial means to claim engagement opportunities.⁷ Although these claimed spaces can address immediate concerns, they tend to be temporary and do not always lead to lasting invited spaces for participation.

Urban water governance involves invited spaces like formal mechanisms like Urban Water User Associations (U-WUAs) and water boards, designed to ensure legitimate stakeholder involvement. Scholars have examined how such participation influences programs,⁸ the effectiveness of WUAs in distribution,⁹ and the potential pitfalls of these formal structures.¹⁰ In contrast, created modes of participation encompass grassroots initiatives and social media campaigns, allowing marginalized communities to contribute their knowledge and experiences. Together, both invited and created spaces are vital for enhancing transparency, accountability, and inclusiveness in urban water governance, ultimately fostering a more democratic and participatory framework that addresses the needs of all citizens. However, for this paper, we are looking at the factors affecting the citizens' willingness to participate in the invited and hybrid spaces for participation in urban water governance of three Indian cities.

Factors Influencing Citizen Participation

Citizen participation in governance is shaped by various factors that can be broadly categorized into contextual factors, process management patterns, demographic variables, trust in government, and perceived performance of service delivery.

1. **Contextual Factors:** Information deficits and asymmetries significantly influence citizen participation. When citizens lack access to accurate information or there are disparities in information distribution, their ability to participate effectively is hindered.¹¹ Additionally, the attitudes of public officials play a crucial role; supportive officials can foster greater participation, while indifferent or hostile attitudes may discourage it.¹²
2. **Process Management Patterns:** The criteria for community representation, the design of participation processes, and the quality of collaboration all impact citizen engagement. Effective process design and inclusive representation criteria ensure that diverse voices are heard, while positive group dynamics and high-quality collaboration enhance the effectiveness of participation.¹³
3. **Demographic Variables:** Demographic factors such as gender, age, education, and income also influence participation levels. Studies have shown that these variables can affect how and to what extent citizens engage in governance. For instance, gender and age can shape perspectives on civic duties, while education and income levels often determine access to resources and information necessary for participation.¹⁴
4. **Trust in Government:** Trust in government plays a crucial role in shaping citizen participation. Higher levels of trust are associated with greater civic engagement, as citizens are more likely to believe that their concerns will be addressed by public officials.¹⁵ Conversely, declining trust can lead to disillusionment, apathy, and a reduced willingness to engage with the political process. This decline in trust is highlighted as a significant factor contributing to the decreasing political participation observed in many societies.¹⁶ Scholars such as Kikuchi¹⁷ and Neblo et al.¹⁸ argue that when governments are perceived as trustworthy, they create an environment that encourages citizens to participate actively in governance. Trustworthy governments are seen as more likely to respond to citizen concerns, thereby fostering a more engaged and participatory public.
5. **Perceived Performance of Service Delivery:** Shortcomings in service delivery, such as inadequate infrastructure or the unfair distribution of resources, can lead to citizen dissatisfaction and

disengagement.¹⁹ When citizens perceive that their needs are not being met, they may withdraw from participatory processes, feeling that their involvement will not result in meaningful change.

METHODOLOGY

Site Selection

This study focuses on three secondary cities of India, i.e., Jaipur, Madurai, and Visakhapatnam due to their growing importance in the urban landscape. Defined by their population size between 1 to 5 million, secondary cities are particularly compelling due to their regional significance and the critical role they play at the national level. The rationale for selecting secondary cities is that they experience faster population growth than megacities, leading to a disproportionate strain on infrastructure as development struggles to keep up with the pace. Moreover, these cities frequently contend with bigger cities due to urban bias which challenges their local governments with access to adequate human resources and financial capacity. Recognizing these dynamics, a purposive sampling approach was adopted, based on criteria such as topography, governance, and infrastructure to provide a representative cross-section of the diverse and pressing challenges that secondary cities encounter today.

Sampling Strategy

For this study, a multi-stage stratified random sampling technique was used to ensure a representative sample of 1,307 respondents across various socio-economic groups and geographic areas within the selected sites. The population was stratified into two categories: MIG-HIG areas and slum areas. In MIG-HIG areas, stratification was based on administrative zones and wards, as defined by the city's Master Plan, further categorized by land use and social stratification. Income groups were classified according to the Pradhan Mantri Awas Yojana (PMAY) guidelines, with Middle Income Group (MIG) and High-Income Group (HIG) households segmented based on specific income ranges—from Economically Weaker Sections (EWS) with an annual income up to Rs. 3,00,000, to High-Income Groups (HIG) earning above Rs. 18,00,000 annually. In slum areas, stratification involved identifying slums according to their classification in urban planning documents, their eligibility for notification, and their size, measured by the number of households. Slums were defined based on Census criteria, which consider areas unfit for human habitation due to factors like overcrowding, dilapidation, and inadequate sanitation. Within each stratum, simple random sampling was conducted, ensuring a balanced representation of different urban groups while allowing for variations in sample size according to the population distribution within each stratum.

Questionnaire, Response Sheet, and Analysis

The study utilized a mix of formats (Likert scales and nominal closed responses) to capture respondents' attitudes and experiences with local government performance in water provisioning and their participation in decision-making processes. Likert scale questions measured the intensity of attitudes, such as their perceptions of government performance and trustworthiness, with options ranging from positive to negative sentiments. Nominal closed questions, with binary (Yes/No) and multiple-choice answers, captured specific behaviors and perceptions, such as water purification practices and perceived health risks. This combination allowed for a comprehensive analysis using descriptive statistics, such as percentages and correlations, to explore relationships between different variables.

FINDINGS

The chi-square findings from the Table for the responses in Jaipur, Madurai, and Visakhapatnam illustrate both common factors and notable differences in the willingness of residents to engage in water-related decision-making. In all three cities, education emerges as a critical determinant of participation,

with higher education levels correlating with increased willingness. In Madurai, for instance, graduates (69.6%) and postgraduates (65.7%) exhibit strong willingness, aligning with the trends seen in Jaipur, where educated respondents are also more inclined to participate. Conversely, illiterate individuals across the three locations show lower engagement.

Age also plays a significant role, though the age groups most willing to participate vary by city. In Madurai, the 18-25 age group stands out with an impressive 83.3% willingness, while in Jaipur, the 40-65 age group is most willing at 35.3%. This divergence suggests that younger individuals in Madurai may be more proactive in civic engagement compared to the middle-aged group in Jaipur. Additionally, older respondents in both Madurai and Jaipur exhibit a sharp decline in willingness to participate, with nearly half of those above 65 in Madurai being unwilling. However, age is not a factor that affects participation in Visakhapatnam. However, other demographic factors seemed to have a significant relationship with willingness to participate in Visakhapatnam. The data highlights the influence of gender, with males being more willing to participate than females (24.6% vs. 16.9%), a factor not as prominently noted in the other two cities. Income also plays a distinct role where higher-income groups exhibit greater willingness, emphasizing the economic dimension of civic engagement.

Factors	Jaipur				Madurai				Visakhapatnam			
	Unwilling	Neutral	Willing	p-value	Unwilling	Neutral	Willing	p-value	Unwilling	Neutral	Willing	p-value
Male	NA	NA	NA	NA	NA	NA	NA	NA	45	30.4	24.6	0.037
Female	NA	NA	NA	NA	NA	NA	NA	NA	55.9	27.2	16.9	
Undisclosed	4.2	0	1.8	0.024	0	0	0	0.003	NA	NA	NA	NA
Below 18	0	2.2	0.6		0	0	0		NA	NA	NA	NA
18-25	19.2	19	19.4		5.6	11.1	83.3		NA	NA	NA	NA
25-40	45.8	45.8	34.1		10.6	34	55.3		NA	NA	NA	NA
40-65	27.5	26.8	35.3		19.1	25.4	55.5		NA	NA	NA	NA
Above 65	3.3	6.1	8.8		46.7	13.3	40		NA	NA	NA	NA
Undisclosed	1.7	0	0.6	0.011	0	0	0	0.001	0	0	0	<.001
Illiterate	21.7	12.3	6.5		36.7	21.7	41.7		51.7	37.8	10.6	
Below Matriculation	6.7	6.7	11.8		10.8	41	48.2		59	26.9	14.2	
Completed Matriculation	10.8	11.2	7.1		16.7	30	53.3		0	0	0	
Intermediate	10.8	14	18.8		13	13	73.9		55.3	21.3	23.4	
Graduate	30.8	31.8	31.4		7.2	23.2	69.6		49.2	22.3	28.5	
Post-Graduate	17.5	24	21.2	20	14.3	65.7	42.6	19.1	38.3			
Undisclosed	NA	NA	NA	NA	NA	NA	NA	NA	0	20	17.1	<.001
Below 50,000	NA	NA	NA	NA	NA	NA	NA	NA	55	31.2	13.8	
50,000-1,00,000	NA	NA	NA	NA	NA	NA	NA	NA	47.3	20	32.7	
1,00,000-3,00,000	NA	NA	NA	NA	NA	NA	NA	NA	31	31	37.9	
3,00,000-5,00,000	NA	NA	NA	NA	NA	NA	NA	NA	0	50	50	
Above 5,00,000	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	
Untrustworthy	50	41.9	50	0.047	NA	NA	NA	NA	52.7	31.1	16.2	<.001
Neutral	30.8	45.3	31.8		NA	NA	NA	NA	56.9	32.1	11	
Trustworthy	19.2	12.8	18.2		NA	NA	NA	NA	45.8	19.6	34.6	
Negative	8.3	8.4	12.4	0.023	NA	NA	NA	NA	50	25	25	0.003
Neutral	29.2	30.2	41.8		NA	NA	NA	NA	38.6	40.2	21.2	
Positive	62.5	61.5	45.9		NA	NA	NA	NA	57.3	24.4	18.4	

Table 1. Capturing the effects of demography, trustworthiness in water managers, perception of water service delivery on citizens' willingness to participate in urban water governance in Jaipur, Madurai, and Visakhapatnam

Trust in water managers is another common theme influencing participation across Visakhapatnam and Jaipur. In Jaipur, respondents who perceive managers as untrustworthy are significantly less willing to engage, reflecting a similar trend in Visakhapatnam, where those trusting water managers show higher willingness (34.6%). Lastly, perceptions of water management reveal interesting contrasts. In Jaipur, those with a positive perception of water management are less inclined to participate, indicating potential complacency among satisfied individuals. Conversely, in Visakhapatnam, individuals with negative perceptions are more likely to engage, suggesting that dissatisfaction may drive civic participation. Overall, while education and trust are consistent influencers of engagement across all three cities, variations in age, gender, income, and perception underscore the complexities of civic involvement in water governance.

LIMITATIONS

This study has limitations that should be acknowledged. First, we explored only a few factors that affect participation and have not looked at contextual factors, process management patterns, and social trust, which may not encompass the full range of influences on civic engagement. Additionally, our analysis was limited to quantitative data, which restricts the depth of insight into the nuances of participation behaviors. Our investigation was confined to formal, invited, or hybrid platforms, leaving out other potential avenues of civic participation. Furthermore, while we examined the differences in participation across three cities, our study was restricted to the "what" of participation patterns without delving into the underlying reasons or motivations ("why") behind these differences, which would require further qualitative exploration.

CONCLUSION

This study identifies education as a key factor driving citizens' willingness to participate in urban water governance across Jaipur, Madurai, and Visakhapatnam. The findings of this study reveal that education and trust in water managers are consistent determinants of citizen participation in water-related decision-making across Jaipur, Madurai, and Visakhapatnam, with higher education levels and trust correlating with increased willingness to engage. However, the impact of other factors like age, gender, income, and perceptions of water management varies significantly by city, indicating that local socio-cultural dynamics play a crucial role in shaping civic participation. For instance, younger individuals in Madurai are more proactive, while middle-aged groups in Jaipur are more willing to engage, and in Visakhapatnam, gender and income strongly influence participation. The study underscores the importance of understanding these local variations for developing effective, inclusive water governance strategies. These findings highlight that while education and trust are broadly influential, targeted approaches that consider specific demographic and socio-economic contexts are essential to enhance citizen participation in water management.

NOTES

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- ² Amartya Sen, *Development as Freedom*, (New York: Alfred A. Knopf, 1999).
- ³ Ghazala, Mansuri, and Vijayendra Rao, "Can participation be induced? Some evidence from developing countries," *Critical Review of International Social and Political Philosophy* 16, no. 2 (April 8, 2013): 284.
- ⁴ Stuart Langton, "Citizen Participation and Citizenship Education in the 21st Century," in *Citizenship for the 21st Century*, ed. William T. Callahan, Jr. and Ronald A. Banaszak, (San Francisco: Foundation for Teaching Economics, Social Studies Development Centre and Constitutional Rights Foundation, 1990), 297-310.
- ⁵ Arnstein, 216-224.
- ⁶ Arnstein, 216-224.
- ⁷ Sejal Patel, Richard Sliuzas, and Yola Georgiadou, "Participatory local governance in Asian cities: Invited, closed or claimed spaces for urban poor?," *Environment and Urbanization Asia* 7, no. 1 (2016): 1-21.
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- ⁹ Ellis Adjei Adams and Leo Charles Zulu, "Participants or Customers in Water Governance? Community-Public Partnerships for Peri-Urban Water Supply," *Geoforum* 65 (2015): 112–124.
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- ¹¹ Neal D. Buckwalter, "The Potential for Public Empowerment through Government-Organized Participation," *Public Administration Review* 74, no. 5 (2014): 573–584.
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- ¹⁴ Tom Christensen and Per Lægred, "Trust in Government: The Relative Importance of Service Satisfaction, Political Factors, and Demography," *Public Performance and Management Review* 28, no. 4 (2005): 487–511.
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- ¹⁸ Masao Kikuchi, "Assessing Government Efforts to (Re)build Trust in Government: Challenges and Lessons Learned from Japanese Experiences," *International Public Management Review* 8, no. 2 (2007): 183–203.
- ¹⁹ Evan M. Berman, *Dealing with Cynical Citizens* (Thousand Oaks, CA: Sage Publications, 1997).

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EXAMINING INFORMAL LIFE AND SPATIAL APPROPRIATIONS IN THE HISTORIC CITY - AN ETHNOGRAPHIC APPROACH

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INTRODUCTION

This work is based on empirical fieldwork and observations of informal public social life, focusing on the movement and social interactions among urban dwellers in the public spaces, by referencing cases both within the context of a local condition – that of the Phaneromeni parish of the historic city of Nicosia in Cyprus – but also looking outside the confines of the focus, so as to present a wider picture of this urban condition.

An overall argument will be made that these spaces and the spatial conditions that describe them constitute a distinctive set of informal social settings, that are often described as “fourth places” in the literature and that find their place alongside the other three realms of social life – home, work and “third places”. If paths offer spatial, behavioural and sensorial variation, in terms of enclosure and width, types of encounter and vistas, then looking at informal corridors of mobility may enhance the utilization of urban space in the historic city and enrich the experience of engaging in everyday public life by the urban dweller.

The approach is one of an ethnographically infused, heritage-led urban regeneration paradigm. Such an approach benefits from participatory planning. Conservation and rehabilitation in this manner has become a strategy to achieve a balance between urban growth and quality of life that makes cities more liveable. Furthermore, the introduction of a systems-thinking approach may potentially unveil the dynamic and complex interactions at work linked to community development.

In this way, hidden events and patterns and mental models may be revealed, and the interconnectedness of socio-spatial structures and elements may be observed and better understood. This constitutes a useful tool for mapping, modelling and simulating the change of a spatial system’s parameters over time and helps improve the townscape.

Pedestrianization

The work applies Michel de Certeau's concepts from *The Practice of Everyday Life*¹ to examine the relationship between space production and informal appropriation in the city that may lead to an “environment,” establishing a “proper place” from which urban dwellers engage with others. In urban studies, de Certeau's theoretical approach has gained renewed attention.²

The work tries to assess the relevance of this conceptual model, within the historic center of a city. De Certeau's theory emerged at the onset of a systemic crisis that led to restructuring and re-scaling and

gave rise to numerous global hubs within the context of economic development.³ The work adopts a critical perspective to expand the framing of the growing research on informal space appropriation practices.

The goal is to move beyond the narratives of everyday generic spaces to better understand space production in a deregulated context of urban planning. Recent studies have increasingly focused on open public spaces as sites for reclamation and appropriation, particularly by marginalized groups such as migrant workers.⁴

Informality

Informality, in the form of temporary, and insurgent practices, are also of interest to this design team, as modern expressions of collective realms that challenge traditional approaches to public space provision.⁵ These are described using terms like “insurgent public space”, “loose space,”⁶ “temporary city”⁷ and “everyday urbanism.”⁸ Such practices of space appropriation are observed in vacant lots,⁹ urban sidewalks,¹⁰ street corners,¹¹ station exits,¹² skywalks,¹³ urban parks, under-utilized public spaces¹⁴ and pedestrianized streets. These spaces have been seen to serve as platforms for political expression and grassroots activism.¹⁵

LITERATURE REVIEW

In their work “Inclusive Urban Design: Streets for Life”¹⁶ Elizabeth Burton and Lynne Mitchell argue that the complexity of urban environments is shaped by various participants. It is outlined through the roles and responsibilities of different actors in implementing the concept of liveliness. Yet others¹⁷ underscore the conflicting demands that urban designers face, such as conservation, environmental sustainability, aesthetics, and cost considerations. Caterina Villani and Gianni Talamini,¹⁸ revisit pedestrianization in the city as “a site of conflict between dominant commodification strategies and informal communal practices,” while the global city embodies characteristics of both the “global city,” as defined by Saskia Sassen,¹⁹ and the “neoliberal city,” as described by scholars such as David Harvey,²⁰ Neil Brenner and Nik Theodore.²¹ In this urban context, pedestrianization emerges as an effort to establish new forms of urban commons.

Further researchers draw on the concept of “the right to the city” as articulated by thinkers like Lefebvre and Harvey.²² The extent to which space is contested, claimed, transformed, and modified by social processes reflects the notion of inhabitation and relates to the “plasticity” of space and the degree of freedom within it.²³

Theoretical framework

The theoretical framework as introduced by Michel de Certeau in “The Practice of Everyday Life” to analyze the creation and usage of pedestrianized streets in the city, may help inform “strategies” and “tactics” that may help researchers to explore how promoting pedestrianization may result in informal, stationary activities that occupy these spaces.

This may lead to reallocation of space for nonmotorized transportation and pedestrians,²⁴ both of which enhance the urban environment as a space for lingering,²⁵ and support heritage conservation.²⁶ Research indicates that pedestrianization is linked to increased stationary activities, such as sitting, strolling and socializing.²⁷

Other studies suggest that current evaluations of pedestrianization might be too narrowly focused, neglecting broader implications²⁸ and may overlook how such traffic restrictions can enforce a “hierarchization of urban classes, behaviors, and territories.”²⁹ These measures may also spur real estate speculation, displacement of low-income residents,³⁰ and lead to gentrification.³¹

METHODOLOGY

The study employs a mixed-method approach to operationalize de Certeau's conceptual model. Behavioral and sensory mappings (Figure 1) are used to serve as the primary research method to analyze patterns of informal activities. This method makes use of an observational technique that compares the physical characteristics of an environment with the behavioral information of its users by recording their spatial and temporal attributes³² and types of activities observed. It involves extensive observation of designated settings for the creation of base maps that may be used as primers for design proposals, the creation of an accurate base map, and the definition of the types of activities to be observed.

The choice of this method was also influenced by the work of William Whyte and Jan Gehl, along with recent studies by Vikas Mehta and Yasser Elsheshtawy, who have focused on such settings in the Boston metropolitan area.

The study area is highly accessible through a network of mobility corridors and places of pause and areas of collective activities, so the Phaneromeni area case study was selected for empirical analysis based on the presence of these factors.³³

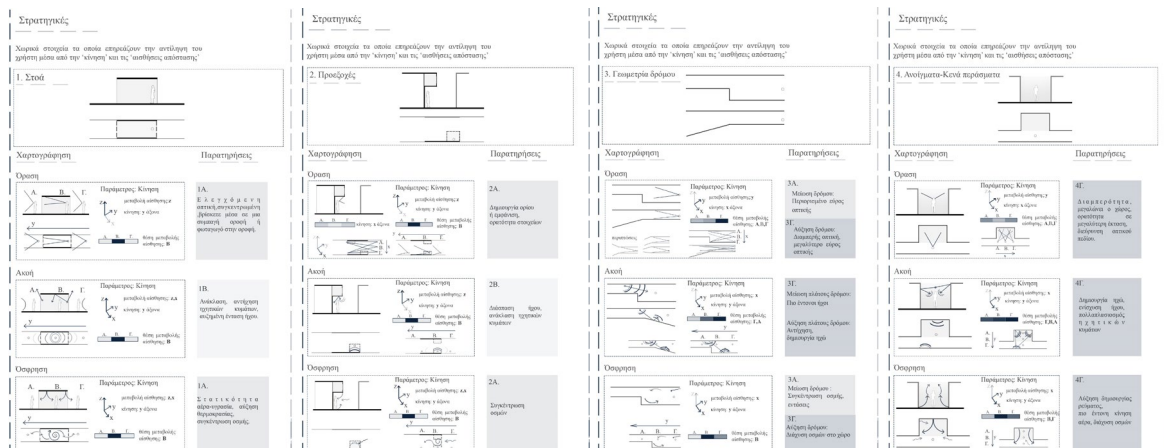


Figure 1. Sensory mappings through different perceptions.

The application of ethnography

The application of ethnography in such a design setting³⁴ was also deemed relevant in the way it may reveal – in the conceptualization phase of a design proposal – how designers adapt mapping methods to fit creative processes. It is thought that designers often replace conventional data collection and analysis with embodied research methods, incorporating their spatial awareness and creative instincts. This approach³⁵ has resulted in a unique blend of observational and participatory research that subsequently informed design work.

Visual artifacts,³⁶ such as drawings, models and sketches, have also been used to inform the design process. These artifacts help bridge the gap between abstract ideas and realizable actions, playing a key role in how designers imagine, test, and stabilize their concepts for future implementation.

Sensory inputs

Sensory inputs have also been examined and used as spatial analysis tools from a phenomenological perspective, focusing on how sensory inputs may be used to shape space. This approach has tried to emphasize the cognitive and narrative practices through which designers and strategists make sense of informality and uncertainty to craft actionable plans (Figure 2).³⁷

This approach,³⁸ as seen in the works of Albena Yaneva and Momoyo Kaijima,³⁹ involves architects and architecture students engaging in ethnographic observation with a heightened awareness of space, form and materiality, informing the senses and contributing to a deeper understanding of how built environments shape and are shaped by social and cultural practices.⁴⁰ This architecture without architects, as Bernard Rudofsky⁴¹ coined it, makes the most of local building techniques and local materials⁴² in the context of vernacular architecture in the historic city, which can lead to alternative representations of ‘the other.’⁴³

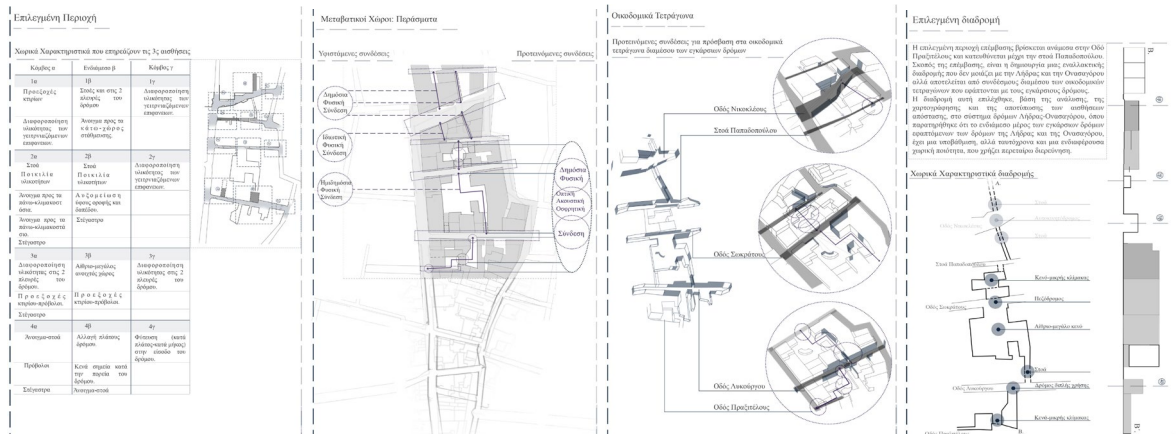


Figure 2. Mappings transcribed and related to the site.

The notion of “fourth places”

In her paper,⁴⁴ Patricia Simões Aelbrecht introduces the concept of ‘fourth places’ as a new category of informal social settings, complementing the existing notion of ‘third places.’ Based on extensive empirical research within a master-planned neighborhood, Aelbrecht⁴⁵ demonstrates that while ‘fourth places’ share social and behavioral traits with ‘third places,’ they diverge significantly in terms of activities, users, locations, and spatial conditions.

‘Fourth places’ are characterized by their spatial and temporal ‘in-betweenness,’ and their strong sense of publicness (Figure 3), which fosters social interactions among strangers. Despite the consensus on their significance, there remains ambiguity around what constitutes meaningful interactions and the methods to achieve them. Scholars argue⁴⁶ that regular encounters between strangers in public spaces are crucial for social cohesion, with strategies like temporary uses and events playing a role in activating these spaces.

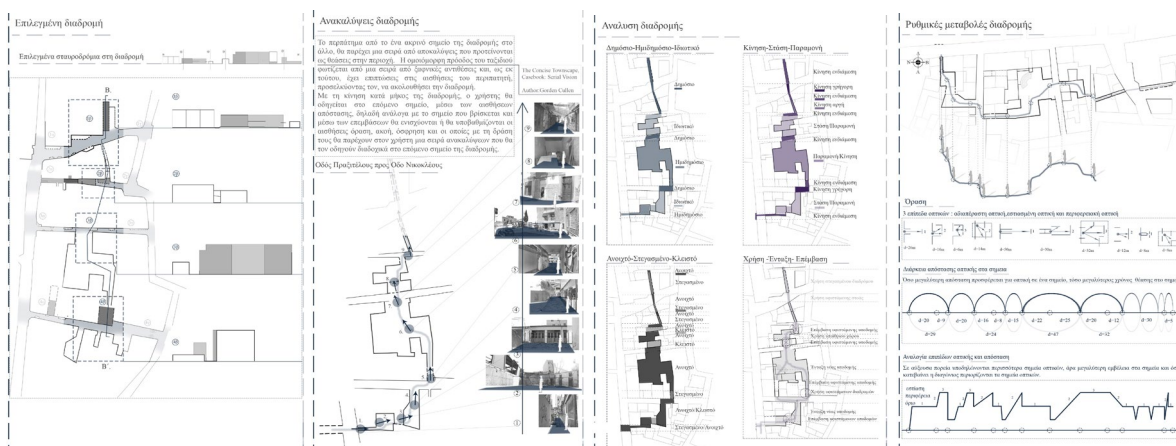


Figure 3. Site identification of “fourth place” potential.

FINDINGS AS A PRIMER FOR DESIGN

The literature review was followed by setting up the structure of a design exercise on how space and spatial arrangements may intersect with human cognition, social behavior and cultural production, especially in the context of design studios and architecture. The key thematic attributes that would characterize the design proposal are outlined below:

Intelligent use of space

Kirsh⁴⁷ emphasizes that space, much like time, memory and energy, is a crucial resource that must be managed effectively. Intelligent use of physical space can enhance human performance by improving memory, attention, and decision-making. Space is thus seen as a kind of technology that supports human actions, often unconsciously aiding in our planning, thinking, and behavior.

Space as a facilitator of social interaction

The role of space in supporting social activities is highlighted as a critical component of human cognition in collaborative contexts. Spatial arrangements in design studios, for example, are not just backdrops but active participants in the creative process, influencing how designers think, interact, and create.

The entanglement of humans and the built environment

The relationship between humans and their built environments is described as an ongoing entanglement, where architecture is not just about buildings but involves various factors like materials, sensory experiences, and legal frameworks. This complex interaction influences how spaces are lived and how humans relate to their surroundings.

Vernacular architecture and cultural theories

The text touches on the study of vernacular architecture, which has been a focal point for both architects and anthropologists. This interest often revolves around learning from traditional building techniques and materials to develop environmentally and culturally responsive designs. However, the text also warns against romanticizing or oversimplifying these traditional forms.

Identification of the specific spatial conditions that make ‘fourth places’

These include the flexibility of use and their ‘in-between’ nature, both spatially and functionally. Unlike ‘third places,’ which are often tied to specific businesses like cafes, ‘fourth places’ exist in more ambiguous spaces—thresholds, edges, and transitional zones. These spaces are inherently adaptable and open to diverse uses, making them highly conducive to informal social interactions.

Case study and inclusivity

The findings from this research highlight the importance of recognizing ‘fourth places’ alongside traditional social realms—home, work, and ‘third places.’ ‘Fourth places’ stand out for their inclusivity and the diversity of social interactions they support, offering a more socially diverse environment compared to the often-homogeneous settings of ‘third places.’ It may then be suggested from the spatial appropriation examples shown below (Figure 4) as part of the Phaneromeni Area case study that incorporating a moderate level of diversity in space design may offer a variety of usage possibilities for the enhancement of informal and inclusive public life in the historic city.

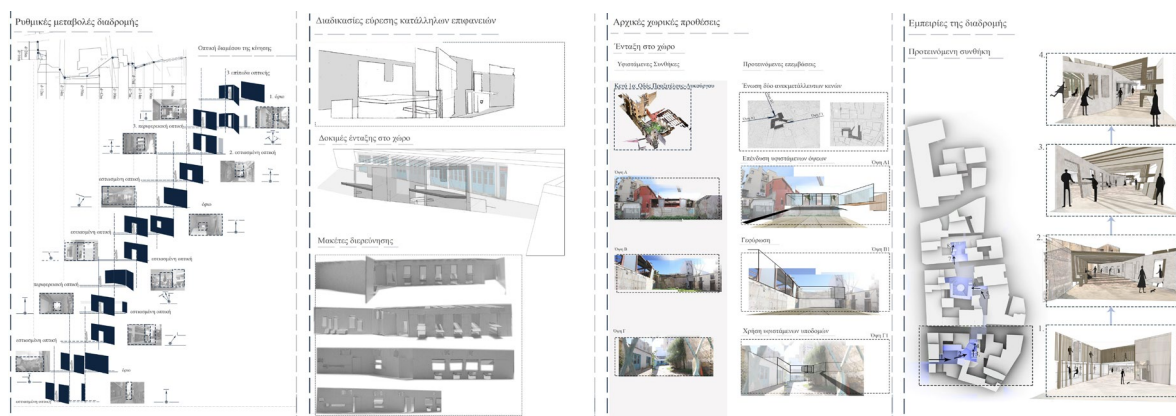


Figure 4. Possible informal and inclusive site interventions for enhancing public life.

Consequently, the design component of this advanced studio was to use the spatial framer described above, together with the proposed toolset and architectural compositional suggestions to opportunistically find opportunities to intervene in this extended site. Site investigations revealed two fairly distinct cases: interventions that could occur in mid-block situations and those that occurred at the boundary conditions between the building blocks examined and the streets that surrounded them.

In the case of mid-block interventions, the proposed program was informed by existing uses and the potential for complementary or enriching programmatic interventions. The kit-of-parts that has been suggested is geared for use by semi-skilled laborers – potentially members of the community in this neighborhood – utilizing simple, inexpensive and readily available tools. The weight and durability of the components was such that it could be handled by two people, erecting structures that do not extend beyond a couple of floors above ground, which conforms to the majority of building massing in this part of town. The program was further informed by the sensory and ethnographic analysis of the area and its users, so as to take full advantage of the sensory and ethnographic dynamics as these have been revealed in the previous analytical exercises.

Similarly, the boundary condition interventions had the challenges and opportunities of rethinking the introduction of the suggested uses and functions occurring mid-block to the occupants not only of the adjacent urban fabric – the needs and aspirations of whom these interventions would address, but also to the city dwellers inhabiting and using the formal street network of this areas of the city. Spatial and sensory inputs and outputs are used to reveal both – directly and indirectly – the proposed mid-block functions to the city dwellers by addressing the threshold at the street-wall. Additionally, the threshold conditions need to address the degree of continuity and relatedness desired between functions of one mid-block intervention and the next, across the street the separates these respective city blocks.

In this way, this informal spatial and sensory narrative unfolds, and it is structured so that it may become part of a contiguous and spatially continuous network of informal movement and habitation in the historic city. Equally well, it may function in a piecemeal and programmatically autonomous way within each block. Underutilized urban fabric may thereby become available to be informally appropriated by the community following negotiations between residents that will determine its spatial and sensory characteristics.

CONCLUDING THOUGHTS

Overall, the study argues for an understanding of space and architecture as connected to human cognition, social interaction, and cultural production. It calls for interdisciplinary approaches to design that consider these entanglements and promote more livable and sustainable environments.

Through tactical appropriation of pedestrianized spaces, individuals assert their right to engage in stationary activities, which may not be possible in other parts of the city due to a lack of public open space. This process reflects a gradual shift toward more comprehensive urban design strategies that utilize pedestrianization to achieve various goals, as outlined below:

Responsive urban design and site-specific considerations

The work emphasizes the importance of responsive urban design, advocating for site-specific approaches grounded in empirical evidence and the direct involvement of all stakeholders in the policy-making process. It suggests prioritizing the production of spaces that accommodate a wide range of uses and address adverse climatic factors. The theoretical framework proposed by de Certeau offers valuable insights into the findings, particularly highlighting the contrast between governmental strategies of space production and the informal tactics of space appropriation in pedestrianized areas.

Urban design and its link to environmental and behavioral studies

Historically, urban design has been closely linked with environmental and behavioral studies, focusing on the social aspects of urban spaces. Although recent research has delved into the social potential of public spaces, it often lacks a deeper understanding of the micro-sociological interactions within these spaces. Nonetheless, a solid body of knowledge exists on the design features that promote social behavior across various public settings, from traditional squares to informal gathering spots.

Mixed Relational Locales and Locational Characteristics

The indicative design proposal has been distinguished by a mixed relational nature, accommodating a broad range of activities that occur in 'in-between' spaces. These spaces are not limited by specific functions but are flexible and adaptable, often located in transitional zones such as thresholds, paths, and nodes. Their public and anonymous character further enhances their role as settings for informal social interactions among diverse groups of people.

Impact on design education

The recognition of urban design as a facilitator of vital informal social settings offers significant insights for urban design education. Designers, especially students, can benefit from understanding the social impacts of their design choices, equipping them to create spaces that foster meaningful interactions and adapt to changing social dynamics.

NOTES

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DETERMINATION OF PLOS BASED ON THE DELAY IN FREE-FLOW PEDESTRIAN SPEED ON FOOTPATH

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INTRODUCTION

The quality and effectiveness of pedestrian infrastructure significantly influence the environmental sustainability of an urban area. This includes the presence and condition of footpaths and the overall walking environment, which directly impact pedestrian movement. To assess the pedestrian level of service (PLOS), we utilise methodologies and standards outlined in the Highway Capacity Manual (HCM-US and Indo-HCM) and the Indian Roads Congress (IRC). PLOS is a quantitative assessment tool for evaluating pedestrian facilities based on factors such as Flow Rate, Speed, Space/Density, and V/C Ratio of pedestrians on the footpath. The HCM methodology for PLOS evaluation focuses on free-flow pedestrian movement, representing an ideal scenario where pedestrian flow is uninterrupted. However, various factors can disrupt this continuous flow due to the effect of changes in elevation, obstructions, encroachments, user conflicts, vehicular conflicts, queuing/platooning, presence of landscape/public amenities, and climatic conditions (rainfall, water logging, and no-shading devices). Researchers have begun investigating innovative approaches to assess and evaluate pedestrian facilities in urban environments. Each study aims to analyse urban areas based on specific assumptions and factors derived from real-time observations. A pedestrian level of service study, Phase-1, was conducted in New York City to refine the methodology for assessing pedestrian level of service (PLOS).¹ The objective was to evaluate the effectiveness of the HCM model for pedestrian facilities within the city. The researchers sought to connect the pedestrian, environmental, and flow characteristics to evaluate PLOS. They examined personal attributes, trip purposes, and pedestrian behaviours on sidewalks, considering factors such as gender, age, use of walking aids, group size, and the nature of trips. The study also looked at flow direction and platooning, which detailed the space occupied on the footpath over time by various individuals and their purposes. However, a significant limitation of the study was its tendency to consider these factors in isolation rather than integrating them with the pedestrian speed. Investigation of various factors influencing the evaluation of footpaths, including capacity, environmental conditions, vehicle presence, pedestrian behaviour, and road geometry.² Analysis of parameters like density, speed, space, volume, vehicle-to-capacity ratio, flow rate, vehicular volume, obstructions, surface conditions, delays, and land use across different pedestrian facilities was conducted, overlooking the continuous pedestrian movement.³ Research addressing the factors affecting this continuous movement has been conducted in isolation. Pedestrian speed is influenced by age, group dynamics, gender, and trip purpose, which should be considered in PLOS evaluations and need statistical analysis.⁴ Study the impact of obstacles along a path based on a rating scale⁵ and

evaluate the number of obstructions based on a regression equation⁶ neglecting the length of obstruction along the path. Study on presence, continuity, obstructions, levelness, and condition for the effect of weather in a weighted scoring⁷ and the influence of street vendors on pedestrian movement, analysing how different scenarios or pedestrian densities affect both unidirectional and bidirectional flow through simulations.⁸ Lastly, pedestrian speed and flow rates for various land use, age, and gender are considered,⁹ but the emphasis was primarily on land use rather than the significance of trip purposes. With consideration to that, the research determines to a) identify the gap in the existing methodology as described in the standard based on the continuous pedestrian movement on footpaths, b) Identify the factors affecting the continuous pedestrian movement causing a delay while travelling along the footpath and its impact on the free-flow pedestrian speed on the footpath and c) Incorporate the factors affecting the free-flow pedestrian speed onto the existing standard for evaluating PLOS, which leads to the aim “Formulate an evaluation methodology to determine the PLOS of sidewalk based on Continuous Pedestrian Movement (CpM)”. The aim can be achieved by " integrating factors causing delay and influencing the free-flow movement of pedestrians on evaluation methodology in determining the PLOS”. The study is entirely based on the input data obtained through the survey from the selected streets in the study area (Ernakulam, Kerala). CpM directly correlates with travel speed, and the delay pedestrians face on the footpath. The research is based entirely on the factors influencing pedestrian speed and delays in the free-flow pedestrian speed on footpaths.

METHODOLOGY AND NEED OF THE STUDY

A thorough analysis of the current standards in the evaluation process is conducted to identify gaps, mainly focusing on the CpM along footpaths. By examining various studies and surveys carried out in the study areas through observational methods, the factors influencing free-flow pedestrian speed and those contributing to delays are identified. These factors are categorised, and on-site surveys are performed to measure the pedestrian speed associated with each factor. Figure 1 illustrates the details of the survey conducted for this research, ensuring an equal percentage of male and female samples.

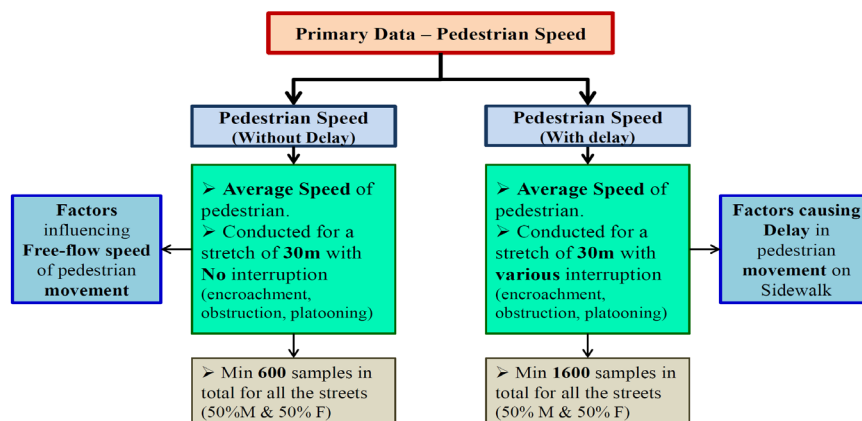


Figure 1. Details of the sample and method for conducting the Primary Survey

The survey focused on a specific section of the footpath, allowing for observation of the starting point from the endpoint. For measuring pedestrian speed without delays, it was essential to have an uninterrupted stretch of at least 50 meters, with the surveyed distance marked at a minimum of 30 meters. In contrast, for the delay parameter, the area causing delays was examined separately, requiring a total length of 30 meters along the footpath to assess the deceleration and acceleration of pedestrians. The surveyor at the endpoint utilised a stopwatch to record each identified pedestrian's time traversing from the starting point to the endpoint. This procedure was repeated until the necessary sample size was

achieved. The collected data is then compiled and analysed using linear regression to evaluate the impact of each factor on pedestrian speed. The existing methodology is refined to address the necessary adjustments for assessing pedestrian facilities based on continuous pedestrian movement. This results in a new methodology for evaluating PLOS that emphasises delays in free-flow pedestrian speed.

Need for study - analysis of existing standards and their limitation.

The assessment of transport-related issues, particularly regarding pedestrian infrastructure, relies heavily on the Highway Capacity Manual (HCM). The development of evaluation techniques and methodologies stems from various studies carried out by transport research institutes in the United States, drawing from European and American contexts. However, pedestrian behaviour and patterns in India are markedly different from those observed in Europe and the United States. India is characterised by diversity and vibrancy, where pedestrian behaviour is closely linked to the surrounding land use. Historically, due to limited research specific to India, agencies adopted HCM standards directly and integrated them into the Indian Road Congress (IRC) guidelines. Following 1990, extensive research focused on the Indian context led to establishing a tailored standard known as Indo-HCM, which addresses the unique conditions in India. This standard offers a variety of methodologies and techniques for evaluating both pedestrian facilities and various modes of transport, including motorised and non-motorized options.

In the US-HCM, the assessment of the PLOS relies on the assumption of pedestrians walking at a free-flow speed on the footpath. In step 3, the HCM acknowledges pedestrian delays at intersections but overlooks delays along the footpath, which can disrupt the continuous flow of pedestrian traffic. Furthermore, in step 4, the travel speed is again based on the free-flow walking speed, failing to consider various factors that can influence this speed and the different elements that may cause delays in pedestrian movement. As illustrated in Figure 2, the current methodology has been revised to address the shortcomings identified in the US-HCM.

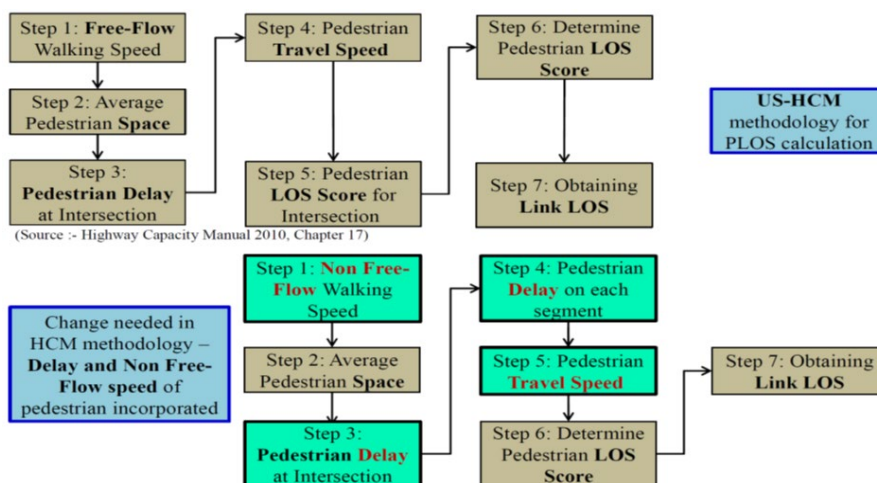


Figure 2. The gap in the methodology in US-HCM for the evaluation of PLOS.

In the Indo-HCM framework, the Pedestrian Level of Service (PLOS) is assessed by analysing the maximum flow rate of pedestrians across different land use zones, assuming a continuous pedestrian movement. In India, the land use patterns along urban streets are typically mixed, making identifying a specific land use difficult. Therefore, the pedestrian speed and flow on these streets should be evaluated based on the specific purposes for which pedestrians access these areas. Additionally, delays

experienced at intersections and along street segments must be factored in to accurately determine the PLOS, as illustrated in Figure 3.

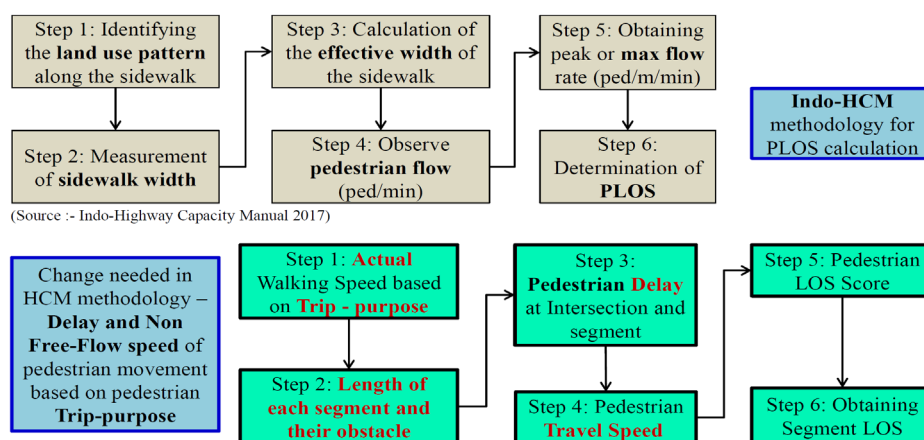


Figure 3. The gap in the methodology in Indo-HCM for the evaluation of PLOS.

The constraints of the standards are outlined in Figure 4. This table offers a comprehensive overview of the factors included in assessing PLOS for pedestrian facilities and those excluded. These deficiencies highlight the importance of considering various factors that affect the unobstructed movement of pedestrians on footpaths, as well as the delays that can occur, ultimately influencing pedestrian flow.

US-HCM, 2000	“The pedestrian methodology for midblock sidewalk analysis cannot determine the effects of the high volume of pedestrians entering from an office building or subway station doorways . It also cannot determine the effect of the high volume of motor vehicles entering or leaving a parking garage and crossing the sidewalk area ”.
US-HCM, 2010	“If a sidewalk is not available for the subject side of the street, then it is assumed that pedestrians will walk in the street on that side (even if there is a sidewalk on the other side)”. “ Pedestrian speed should reflect conditions in which there are negligible pedestrian-to-pedestrian conflicts and negligible adjustments in a pedestrian’s desired walking path to avoid other pedestrians ”. “Average pedestrian space depends on the effective sidewalk width, pedestrian flow rate, and walking speed”. “The analysis methodologies presented do not consider the continuity of walkways, bikeways, and shared-use paths in determining the LOS”.
Indo-HCM 2017	“The pedestrian facilities are analysed by using factors like speed, pedestrian flow and density culminating with capacity and Level of Service (LOS) of various forms of pedestrian facilities . Apart from these quantitative factors, qualitative factors like pedestrian needs and perceptions of the pedestrians in the form of subjective data are also included in defining Walkability Index for Footpaths”. “ Mean walking speed is the fundamental component of pedestrian flow model and free-flow speed indicates the average speed of pedestrians when other pedestrians do not hinder them in an obstacle-free environment under normal conditions. ”

Figure 4. Limitations as stated in the standards for the evaluation of PLOS^{10 11 12}

ANALYSIS OF THE STUDY – DELAY IN THE FREE FLOW PEDESTRIAN SPEED

The research focuses on the urban region of Ernakulam, located in Kerala, India. Being a commercial hub of Kerala, the city spans an area of 2924 km² and has a population density of 1072 individuals per km². The urban landscape features distinctive streets with mixed land use, as illustrated in Figure 5, which highlights the specific street chosen for the surveys conducted in this study.

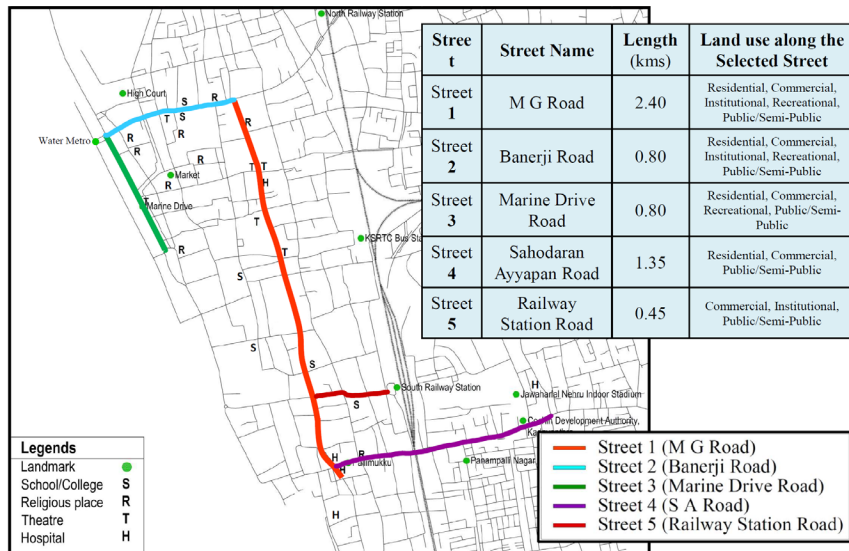


Figure 5. Streets identified in the study area of Ernakulam.

Observation of the study area during the reconnaissance survey

The streets selected for this study exhibit diverse land uses and characteristics catering to various users. Given the different land uses, pedestrians on the footpath have distinct travel purposes, leading to variations in their speed based on the urgency of their trips. Consequently, factors such as age, gender, group size, and trip purpose significantly impact the free-flow movement of pedestrians. Various factors can cause delays in pedestrian movement, as illustrated in Figure 6, prompting pedestrians to divert from their direct path to alternative routes. Figure 6 also depicts pedestrian movement on the footpath around obstacles and the conflicts with vehicles occurring on the streets.

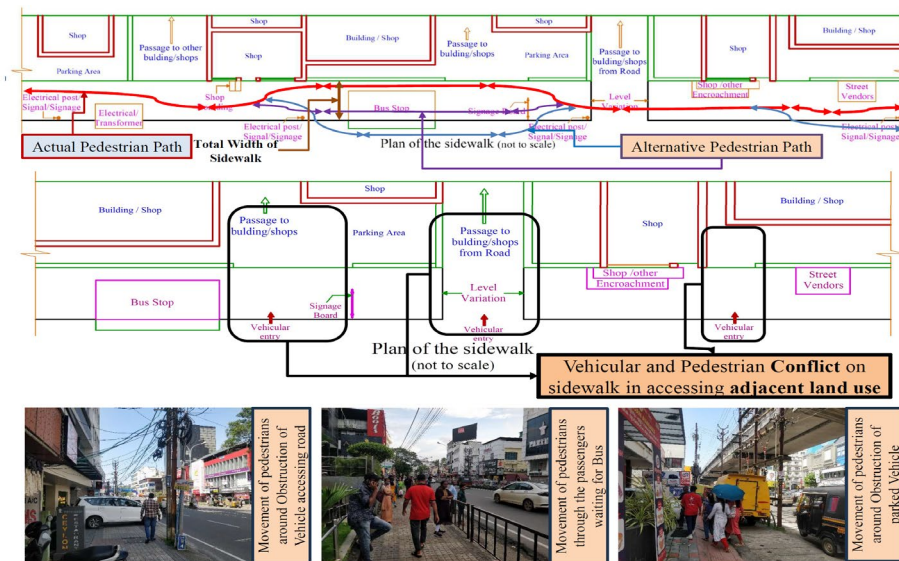


Figure 6. Movement and Pathway of pedestrians on the footpath along with vehicular conflict points.

Factors affecting the CpM on footpaths

Pedestrian movement is not constant due to various influencing factors that can cause individuals to slow down or halt. Consequently, the uninterrupted movement of pedestrians is contingent upon two main aspects: a) free-flow pedestrian speed and b) delays in free-flow (non-free-flow) pedestrian speed. Free-flow pedestrian speed refers to the average speed of individuals without the presence of hindrances or obstacles on a footpath. This speed can fluctuate based on the pedestrian's age, gender, the size of their group, and the purpose of travel, contributing to variations in pedestrian speed on the footpath. Additionally, certain factors lead to delays in pedestrian movement, causing individuals to slow down or stop, which is due to physical obstructions on the footpath, encroachments, the unidirectional and bidirectional flow of pedestrians, elevation changes, conflicts with vehicles crossing over the footpath and adverse weather conditions. Each significantly influences pedestrian movement delays, thereby affecting the free-flow speed. Figure 7 illustrates the factors that impact free-flow pedestrian speed and the delays pedestrians encounter on footpaths.

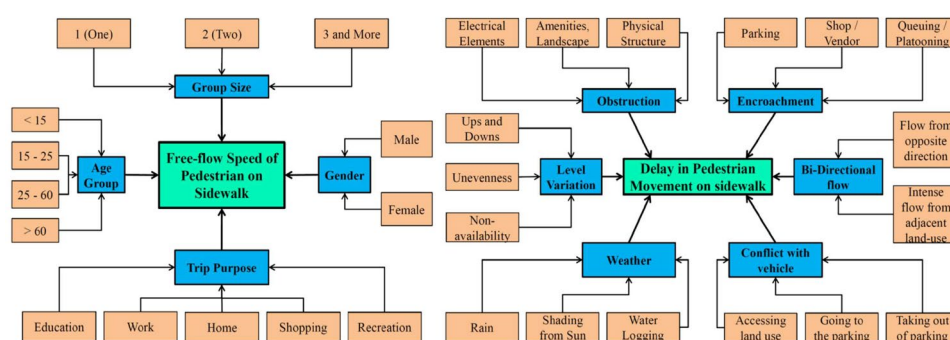


Figure 7. Factors affecting the Free-flow Speed and Delay in Pedestrian Movement on the footpath.

Hypothesis testing - factors affecting CpM

CpM is influenced by several factors, as illustrated in Figure 6: Age group, Gender, Group Size, Purpose, and Reason for Delay. To gain a comprehensive understanding, hypothesis testing will be conducted for each factor. It is essential to evaluate whether pedestrian speeds are consistent across these factors. The Null hypothesis posits that "the pedestrian speed recorded for each category/factor/variable is uniform across all groups". For instance, the Gender factor suggests that the speeds of males and females are equivalent. The hypothesis is tested for the obtained survey data, and the result is shown in Figure 8. Ultimately, all tested null hypotheses for each factor were rejected. This indicates that pedestrian speeds vary significantly across the different factors/variables. The similarity assessment is conducted for each factor; however, a comprehensive understanding of the sub-factors is also essential. Consequently, each sub-factor undergoes a similarity test, as shown in Figure 8. To establish non-similarity, the significance level of the pairwise analysis must be 0.05 or lower. Since gender comprises only two sub-factors, their similarity has already been established. The remaining five factors were evaluated for similarity, and the results indicate minimal similarity. The findings from the hypothesis testing indicate that each factor and sub-factor has an impact on pedestrian speed on the footpath. These elements will influence the steady flow of pedestrians, which must be considered when assessing the Pedestrian Level of Service (PLOS) for pedestrian facilities. The analysis reveals that pedestrian movement on the footpath is affected by multiple factors that contribute to delays and those that enhance free-flow speed. It is essential to include the impact of delays when evaluating the PLOS of the footpath.

Independent variable/Factor	Null Hypothesis statement	Significance Level (Sig. ^a)	Decision
Gender	The distribution of Delayed Speed (m/min) is the same across categories of Gender.	< 0.001	Reject the null hypothesis
Group Size	The distribution of Delayed Speed (m/min) is the same across categories of Group Size.	< 0.001	Reject the null hypothesis
Trip Purpose	The distribution of Delayed Speed (m/min) is the same across categories of Trip Purpose.	< 0.001	Reject the null hypothesis
Age Group	The distribution of Delayed Speed (m/min) is the same across categories of Age Groups.	< 0.001	Reject the null hypothesis
Reason for Delay	The distribution of Delayed Speed (m/min) is the same across categories of Reason for Delay.	< 0.001	Reject the null hypothesis
a. The significance level is .050			

Pairwise Comparisons of Reason for Delay		Pairwise Comparisons of Group Size	
Sample 1-Sample 2	Sig.	Sample 1-Sample 2	Sig.
Conflict with Vehicle - Weather (Rain)	.0183	3 and Above - 2	.028
Conflict with Vehicle - Bi-Directional Pedestrian Flow	<.001	3 and Above - 1	<.001
Conflict with Vehicle - Encroachment	<.001	2 - 1	<.001
Conflict with Vehicle - Obstruction	<.001	Pairwise Comparisons of Age Group	
Conflict with Vehicle-Level Variation	<.001	Sample 1-Sample 2	Sig.
Conflict with Vehicle - No Delay	<.001	> 60 - 25-60	<.001
Weather (Rain) - Bi-Directional Pedestrian Flow	.014	> 60 - 15-25	<.001
Weather (Rain) - Encroachment	.007	> 60 - < 15	<.001
Weather (Rain) - Obstruction	<.001	25-60 - 15-25	.025
Weather (Rain) - Level Variation (Ups & Downs)	<.001	25-60 - < 15	<.001
Weather (Rain) - Delay	<.001	15-25 - < 15	<.001
Bi-Directional Pedestrian Flow - Encroachment	.048	Pairwise Comparisons of Trip Purpose	
Bi-Directional Pedestrian Flow - Obstruction	.014	Sample 1-Sample 2	Sig.
Bi-Directional Pedestrian Flow - Level Variation	.022	Recreation - Shopping	<.001
Bi-Directional Pedestrian Flow - No Delay	<.001	Recreation - Home	<.001
Encroachment - Obstruction	.046	Recreation - Education	<.001
Encroachment - Level Variation	.012	Recreation - Work	<.001
Encroachment - No Delay	<.001	Shopping - Home	.010
Obstruction - Level Variation	.041	Shopping - Education	<.001
Obstruction - No Delay	.013	Shopping - Work	<.001
Level Variation - No Delay	.015	Home - Education	<.001
		Home - Work	<.001
		Education - Work	.014

Each row tests the null hypothesis (Sample 1 and 2 distributions are identical). The significance level is 0.050.

Figure 8. Null Hypothesis testing of factors and pairwise comparison testing of sub-factors.

DISCUSSION ON THE STUDY

The analysis revealed multiple factors impact free-flow pedestrian speed, which can be treated as an independent variable. Pedestrian speed can be classified into two categories: a) free-flow pedestrian speed and b) non-free-flow pedestrian speed. These categories serve as dependent variables influenced by the independent variables. To gain a deeper understanding, it is essential to investigate the linear relationship between the independent and dependent variables. Notably, free-flow pedestrian speed is a subset of non-free-flow pedestrian speed. We can derive free-flow pedestrian speed by eliminating the 'reason for delay' variable from non-free-flow pedestrian speed. This implies that non-free-flow pedestrian speed, when there is no delay, equates to free-flow pedestrian speed. Therefore, rather than analysing both categories separately, developing an equation for non-free-flow pedestrian speed suffices. Figure 9 illustrates the data for assessing delays in continuous pedestrian movement or free-flow pedestrian speed. The linear regression model has been evaluated for correlation through various methods, with its significance assessed using two-tailed testing, as depicted in Figure 9. The findings indicate a negative correlation, suggesting a notable reduction in the dependent variable in response to changes in the independent variables. The coefficient for the independent variable has been determined, as shown in Figure 8.

Survey	A primary survey was conducted on the field on all identified sidewalks in the urban area.
Date Taken	<ul style="list-style-type: none"> Time taken by the pedestrian to cross/cover the cause of delay in seconds. Length taken on the stretch is 30m, within which the delay on the sidewalk occurs. Each factor is marked independently while taking the travel time.
Sample Size	<ul style="list-style-type: none"> 1733 nos. 1050 - With delay 683 – With no delay (Same sample from the previous survey)
Dependent variable (Y)	Optimum Non Free-Flow Pedestrian Speed(Sonf)
Independent variable (X)	<ul style="list-style-type: none"> a) X1 - Gender (M/F) b) X2 - Group Size (1, 2, 3 and more) c) X3 - Trip purpose (Education, Work, Home, Shopping, Recreation) d) X4 - Age Group (<15, 15-25, 25-60, >60) e) X5 - Reason for delay (No delay, Level variation, Obstruction, Encroachment, Bi-Directional flow, Weather (Rain), Water logging, Conflict with vehicle)
Regression Equation	$Y = \beta_0 + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \beta_4(X_4) + \beta_5(X_5)$

		Gender	Group Size	Trip Purpose	Age Group	Reason for Delay
Delayed Speed (m/min)	Pearson Correlation	-.192**	-.471**	-.496**	-.364**	-.262**
	Kendall's tau b	-.151**	-.378**	-.373**	-.276**	-.176**
	Spearman's rho	-.183**	-.467**	-.489**	-.358**	-.238**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001
	N	1733	1733	1733	1733	1733

** Correlation is significant at the 0.01 level (2-tailed).

Model	Coefficients ^a		Sig.	95.0% Confidence Interval for B	
	B	Std. Error		L. Bound	U. Bound
(Constant)	87.514	.537	<.001	86.461	88.568
Gender	-4.753	.424	<.001	-5.584	-3.922
Group Size	-8.100	.295	<.001	-8.678	-7.522
Trip Purpose	-3.134	.171	<.001	-3.470	-2.798
Age Group	-3.703	.245	<.001	-4.184	-3.222
Reason for Delay	-1.372	.100	<.001	-1.568	-1.176

a. Dependent Variable: Pedestrian Speed (m/min)

Figure 9. Facts were established, and Correlation and Coefficient were obtained for variables causing a delay in free-flow speed using the linear regression equation.

The linear regression equation obtained for the Optimum free-flow pedestrian speed and the Optimum Non-free-flow pedestrian speed are as follows,

$$\text{Sof} = 87.51 - 4.75(X_1) - 8.1(X_2) - 3.13(X_3) - 3.7(X_4) \quad (1)$$

$$\text{Sonf} = 87.51 - 4.75(X_1) - 8.1(X_2) - 3.13(X_3) - 3.7(X_4) - 1.37(X_5) \quad (2)$$

Were, X1–Gender (Male=0 and Female=1); X2–Group Size (1 ped=0, 2 peds=1, >3 peds=2); X3–Trip-Purpose (Education=0, Work=1, Home=2, Shopping=3, Recreation=4); X4–Age Group (<15=0, 15-25=1, 25-60=2, >60=3), X5–Reason for Delay (No-Delay=0, Level Variation=1, Obstruction=2, Encroachment=3, Bi-Directional flow=4, Weather–Rain/Water-logging=5, Conflict with vehicle=6)

From the above equation, we can also get the speed of pedestrian movement with or without delay. But if we extract the Optimum free-flow pedestrian speed (Sof) from the above equation, then the equation changes to,

$$\text{Sonf} = \text{Sof} + \beta_5(X_5) \quad (3)$$

therefor,

$$\text{Sonf} = \text{Sof} - 1.37(X_5) \quad (4)$$

Were Sonf–Optimum Non-Free-Flow pedestrian speed and Sof–Optimum free-flow pedestrian speed
To integrate the optimum non-free-flow pedestrian speed, we need to get equation 22 from HCM 2000, chapter 18, which is Pedestrian travel speed for the segment (SA),

$$SA = LT / (\sum(Li/Si) + \sum dj) \quad (5) \quad (\text{HCM-2000})$$

Were, SA=Average pedestrian travel speed (m/s), Li=Length of Segment i (m), LT=Total length of the urban street under analysis (m), Si=Pedestrian walking speed over Segment i (m/s), dj=Pedestrian Delay at Intersection j (s).

The walking speed of the segment should be the speed of a pedestrian with delay and other influencing variables. As a result,

$$\text{Walking speed of segment, } S_i = S_{of} - k \tag{6}$$

This will result in the modification of the equation of pedestrian travel speed into A new equation for finding Pedestrian travel speed (SA),

$$SA = LT / (\sum(Li / (S_{of} - k)) + \sum dj) \tag{7}$$

Were, Sof=Optimum free-flow pedestrian speed, k=constant of delay occurring on the sidewalk.

Sof – Optimum free-flow pedestrian speed			k - Delay in speed (m/min)	Type of Delay		
Category	Avg. Speed (Male)	Avg. Speed (Female)		0	No Delay	
Group Size	1	75.75	70.95	1.37	Level Variation	
	2	67.60	62.85	2.74	Obstruction	
	3 or more	59.50	54.75	4.11	Encroachment	
Trip Purpose	Education	73.85	69.11	5.48	Bi-Directional Flow	
	Work	70.73	65.98	6.85	Weather (Rain, water logging)	
	Home	67.60	62.85	8.22	Conflict with Vehicle	
	Shopping	64.47	59.72	PLOS	Travel Speed	
Recreation	61.34	56.59	A		m/sec	m/min
Age Group	< 15	73.15	68.40	B	> 1.20	> 72.0
	15 - 25	69.45	64.70	C	> 1.06 – 1.20	> 63.5 – 72.0
	25 - 60	65.75	61.00	D	> 0.92 – 1.06	> 55.0 – 63.5
	> 60	62.05	57.30	E	> 0.78 – 0.92	> 46.5 – 55.0
Gender	67.60	62.85	F	≥ 0.63 – 0.78	≥ 38.0 – 46.5	
				< 0.63	< 38.0	

Figure 10. Value for Optimum free-flow pedestrian speed for various factors, Value of delay(k) or various types of delay and PLOS value for travel speed.

Figure 10 illustrates the ideal free-flow pedestrian speed across different categories, the value of 'k' associated with delay, and the range for determining the PLOS value based on the travel speed along the footpath segment. The PLOS range is calculated from the optimised values gathered from the survey sample. Figure 10 also illustrates the PLOS range for the entire sidewalk or footpath, considering the delay factor in pedestrian movement. This offers a revised approach outlined in the HCM for quantitatively assessing pedestrian facilities.

CONCLUSION

This paper critically examines the criteria used to assess the Pedestrian Level of Service (PLOS), focusing on the methodologies and evaluation techniques employed. The ideal scenario of unobstructed pedestrian movement is seldom realised on sidewalks. Factors such as pedestrian gender, age group, group size, and travel purpose significantly affect pedestrians' free-flow speed during their journeys. These elements directly influence the uninterrupted flow of pedestrians on sidewalks, leading to delays in travel. The study highlights the significance of maintaining continuous movement for pedestrians in assessing PLOS while identifying the various factors that influence free-flow pedestrian speed on walkways and the implications of delays in pedestrian movement.

The relevant factors or variables have been assessed for their significance. The independent variables are associated with pedestrian speed in developing a linear regression equation, determining the optimal non-free-flow pedestrian speed on walkways. The results are integrated into the current HCM standard, enhancing the equation for calculating pedestrian travel speed on footpath segments under various delay conditions. This advancement has improved the quantitative assessment of pedestrian facilities with

delay occurrences. In future studies, delays on sidewalks caused by the presence of individuals with disabilities and the impact of carrying luggage can be factored into pedestrian movement analysis.

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- ⁴ Sangeeth K. And Abhijit Lokre, *Factors influencing Pedestrian Speed in Level of Service (LOS) of pedestrian facilities* (Transportation Research Interdisciplinary Perspectives, 2019), 100066 (1-10)
- ⁵ Nicole Gallin, *Quantifying pedestrian friendliness—guidelines for assessing pedestrian level of service* (Road & Transport Research, 2001), 47-55.
- ⁶ Muraleetharan Thambiah and Hagiwara Toru, *Overall Level of Service of Urban Walking Environment and Its Influence on Pedestrian Route Choice Behavior Analysis of Pedestrian Travel in Sapporo, Japan* (Transportation Research Record. 2007), 7-17.
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- ⁸ Kibret Gebremedhin Hagos, Muhammad Adnan and Ansar-ul-Haque Yasar, *Effect of sidewalk vendors on pedestrian movement characteristics A microscopic simulation study of Addis Ababa, Ethiopia Pedestrian Level of Service Model for Evaluating and Improving Sidewalks from Various Land uses* (Cities, 2020), 102769 (1-11).
- ⁹ Rajat Rastogi, Thaniarasu Ilango and Satish Chandra, *Design Implications of Walking Speed for Pedestrian Facilities* (Journal of Transportation Engineering, 2011), 687-696.
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METHOD OF IDENTIFYING CRITICAL POINTS IN CYCLING INFRASTRUCTURE THROUGH BIG DATA ANALYSIS FOR SUSTAINABLE URBAN PLANNING

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INTRODUCTION

In the quest to improve non-motorized travel and curb CO2 emissions, the ongoing development of cycling initiatives often does not meet the anticipated outcomes. Urban leaders are wrestling with the task of diminishing carbon emissions in city environments, acknowledging the crucial importance of making cycling more attractive. Nevertheless, the establishment of bike lanes presents substantial hurdles, necessitating political bravery and confronting uncertainties.¹

This research focuses on how to use big data to identify critical points in terms of transport. The focus is on revealing critical points for cycling. The goal of the research is to use big data to find these locations and identify efficient transportation routes for residents of new developments that promote environmentally friendly modes of transportation between their new home and the city center.

The application of this method equips the city with a potent analytical instrument, providing insights into essential sectors that require focus for sustainable city planning. The subsequent actions resulting from this analysis assure a direct influence on the development of a consistently safe cycling infrastructure, ultimately increasing its attractiveness to residents of various age and ability groups. This forward-thinking method not only addresses the immediate issues of city administrators but also aligns with the wider objectives of promoting environmentally aware, safe, and appealing urban settings for everyone.

Data for urban planning

Due to the global proliferation of smartphones, both unconscious and conscious production of geolocation data occurs by users and their movements. The aim of this research was to test how this Voluntary Geographic Information (VGI²) from sports apps (e.g. Strava³) can provide a new basis for planning and evaluating resilient and sustainable settlements and the lives of people in them.

We already have the answers in information datasets.⁴ Now we need to ask the questions well that are being offered: How to use big data to find safe and continuous, i.e. attractive, bicycle routes for all ages and abilities as they move through the city, in order to offer residents an attractive transportation alternative to individual automobile traffic (IAT).

For the research, anonymised data on people's movement through the street network, recorded on the sports apps Strava, Cyclers and through the Cycle to Work portal, was used. Routes are generated by

people moving through the city by bike. This network of passages was contrasted with cleansed accident data from the Czech police and open data from the city's cycling infrastructure.

The primary data sources for the analyses used are:

Police Accident Statistics (2010-2024).⁵

Anonymised data on the movement of people⁶ - Commute to work by bike 2022, Automat z.s.

Cycle paths - Open data Hradec Králové (2024).⁷

Infrastructure and its influence on cycling behaviour in the city

Infrastructure plays a crucial role in shaping cycling behaviour in the city.⁸ Safe and well-designed infrastructure can encourage more cycling. Cities with well-developed cycling infrastructure tend to have higher levels of cycling use.

There was in fact a gap between more general work in urban design focused on pedestrians, work in transportation planning focused on motorized vehicles where cyclists posed potential conflicts with vehicles, and cycling research and practice addressing the importance of promoting safety and providing continuous cycling networks.⁹

Conversely, cities with inadequate or unsafe cycling infrastructure can discourage people from using cycling as a mode of transport. Safe and well-designed infrastructure is key to encouraging cycling.¹⁰

There is a notable correlation between bicycle-vehicle conflicts and the following factors: the yearly average of daily vehicle traffic, the average pedestrian traffic per hour, the count of subway (metro) stations, the density of land used for commercial purposes, and the smallest angle of intersection.¹¹ In addition, cities with younger or more environmentally conscious populations may have higher rates of cycling.¹²

CASE STUDY: CITY OF HRADEC KRÁLOVÉ

City of Hradec Králové is a city known in the Czech Republic for its high share of cycling traffic. Even though cyclist accidents happen here and in this research we find out how to detect where for further change of built environment.

Based on the knowledge of the main traffic flows of cyclists (Strava) and the places where reported accidents with cyclists happen (Police data) and infrastructure (open data of city).

Up to 1,000 new housing units are to be built to accommodate 2,500-3,000 new residents as part of a new housing development planned for the southwestern part of Hradec Kralove.

We expect that the residents of the new housing complex will prefer a sustainable and ecological lifestyle, which will also be reflected in the housing.¹³ We expect that they will be interested in moving around the city in an environmentally friendly and environmentally friendly way. Therefore, our analysis focuses on identifying those locations that are critical for cycling, i.e., locations where dangerous traffic situations occur and which may influence individuals' decision making when choosing an environmentally friendly mode of transport.¹⁴

Data visualisation - cyclist traffic flows, accidents and infrastructure

The map shows us city-scale anonymised routes (over 18,000 passes) that show us the busiest routes for cycling for the purpose of analysis. These routes do not reflect sports movement for recreation, but rather daily commuting to and from work plus movement around the city by bike.¹⁵

The map shows the most frequented sections and the existing cycling measures of the transport infrastructure are highlighted in blue. For further consideration, it is therefore clear that people are not moving along a discontinuous network of cycle lanes, but are using the bicycle to get around the city as they need to, regardless of the cycle protection scheme.



Figure 1. VGI - Red lines show the main bicycle traffic flows in the pattern of the city.



Figure 2. Core areas of traffic accidents in HK 2010-2024

In Fig.2 we can see those places which are the most accident prone according to the Police records. In general, the crossings with the ring road are particularly problematic.¹⁶

With respect to the cross-town network, Fig.2 shows at a glance that the bicycle protection feature (recorded in blue) does not mean that the site is not collision prone. On the contrary, analysis may show that poorly designed protective infrastructure may encourage or cause these collisions.

METHODOLOGY

The data was collected from the official statistics of traffic accidents recorded by the Police of the Czech Republic in the period 2010 to 2022. This dataset was subsequently expanded with data on traffic accidents for the years 2023 and 2024, which were obtained from the mapping application of the Police of the Czech Republic. The total number of accidents in the administrative territory of Hradec Králové amounted to 9632. Accidents that involved a collision with a parked or parked vehicle were not included in the analysis in order to better identify the main critical locations in the city's infrastructure. In total, there were 2961 accidents of this type.

The 2023 bicycle pass-by data was obtained from the Bike to Work project. A total of 18,762 individual trips were involved. The data was anonymised by removing the first and last 150 metres of the route. The route did not have any personal information attached to it.

Analysis

The analysis of critical points was based on a hot spot analysis of traffic accidents at a scale of 1:10000. This procedure allowed the identification of locations with the highest concentration of traffic accidents. Each critical location was then analysed within a 75m radius with respect to the total number of accidents in the period 2010-2024 and other relevant attributes (material damage, type of accident). The analysis was performed both at the level of all crashes and at the level of crashes that involved a cyclist (426 crashes).

Critical locations were then analysed in the context of cyclist crossings. The analysis of cyclist crossings was carried out using a specially set symbology to obtain the spatial pattern of the most frequent sections within Hradec Kralove.

The overall picture of the city's traffic safety was also supplemented with a "network" of cycle paths, which, among other things, allows to partially evaluate the efficiency of their distribution. Thanks to this information, it is possible to answer the question of where there is a need to develop cycling infrastructure and where the current network of cycle paths is insufficient due to congestion and increased accident rates.

The chosen methodology allows the reader of the map to identify the places in the infrastructure that need the most attention in terms of safety and should serve as a basis for targeted intervention. The quantitative analysis should also be seen as a precursor to follow-up qualitative research that would better enable the causes of high accident rates at given locations in the city's transport infrastructure to be identified and understood.

RESEARCH RESULTS

The analysis was prepared for the whole city, however, we pay special attention to the critical points on the friction between the zone of new construction in the urban part of Kukleny and the city center. Fig.3 shows us a comprehensive view of the city and its critical points in the transport infrastructure. The map serves as a basis for further decision making on priorities for investment in cycling transport infrastructure.

The critical spot marking is within a perimeter of 75 meters from the largest cluster of crashes, and the number of crashes is always indicated next to the marking in the map and the ranking evaluation in terms of the most critical spot in the city in descending logic in brackets. In general, most intersections with the ring road are problematic.

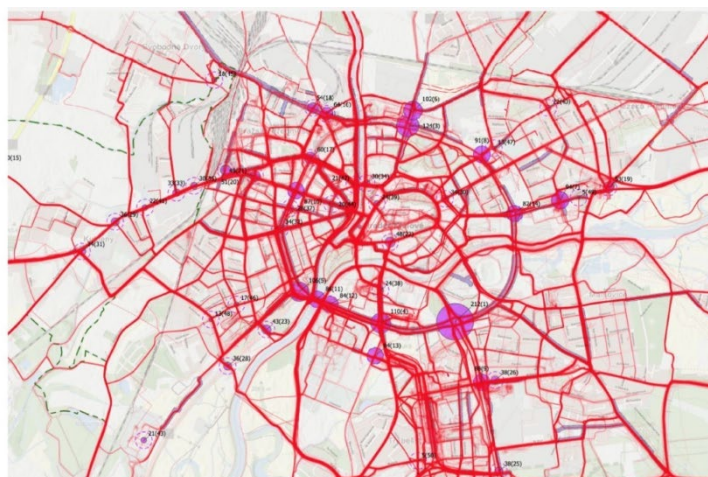


Figure 3. Critical places in the transport infrastructure in Hradec Králové

Prague street (black line – Fig.4) is very unattractive for the development of pedestrian and bicycle transport due to its congestion, and although its revitalization is planned, the map shows at first glance an alternative route to the city "from the back" see below.

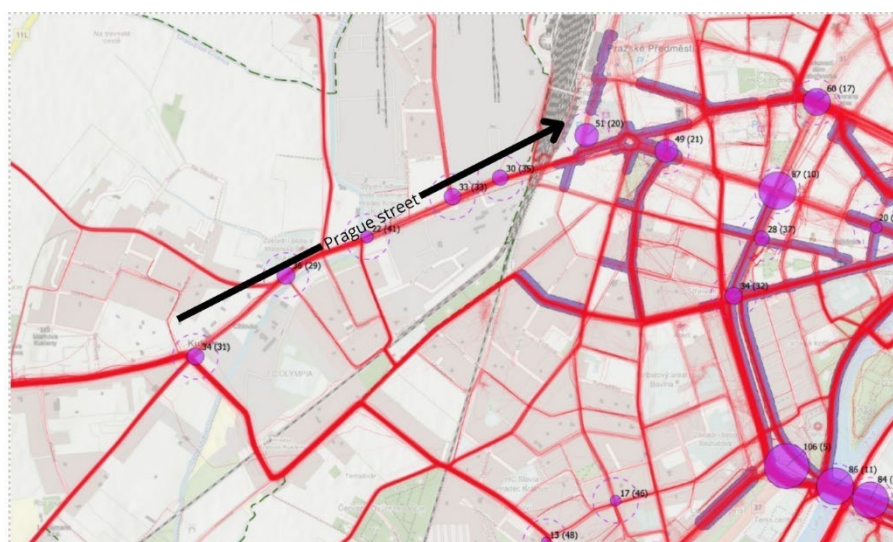


Figure 4. Critical points in the infrastructure from Kukleny towards the center

Core areas of cycling accidents and the most frequent cyclist routes

The Fig.5 shows cyclist-only accidents at the city scale, with the locations of protected cycle provision, here cycle routes, indicated. It can be seen that somewhere the cycling infrastructure is successful and does not generate conflicts (eastern half of the city), while the other part has many times more critical places (western half of the city). This happens mostly at intersections, where the infrastructure brings people to the place but does not support them and does not guide them through the place. This creates a conflict situation for all road users.

Fig.5 shows the city management where there is an increased accident rate for cyclists, i.e. psychological and health damage to the population, including the considerable cost of damage caused by accidents in the city.

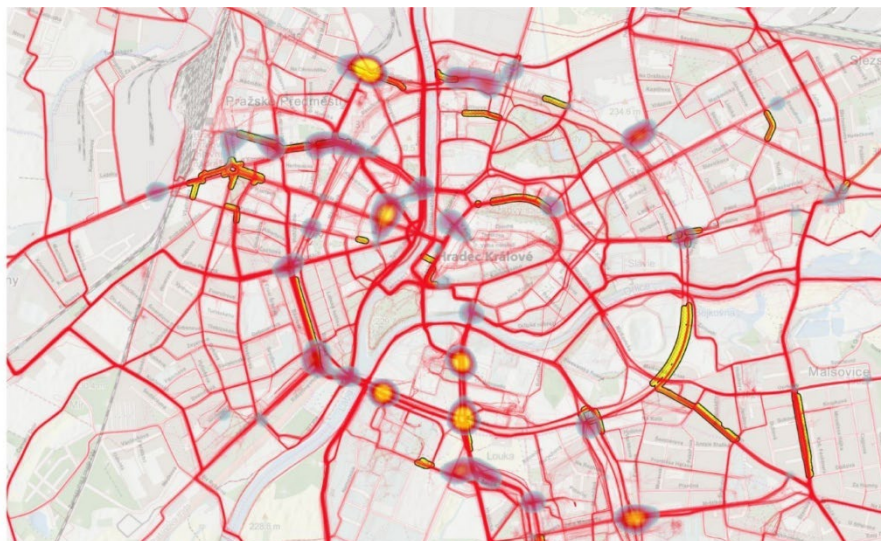


Figure 5. Critical places for cyclists in infrastructure on the scale of the city of Hradec Králové

Fig.5: gives us the context of the main streams of cyclist movement with their most accident prone locations in the city. Theory arising from the research and possible follow-up: If there are several such critical points on the route in succession, the user evaluates the route as potentially dangerous and chooses another mode of transport, regardless of its environmental friendliness and cost. The locations identified in Fig.5: are recommended to be included in the city's priorities for addressing the safety and permeability of cycling in the city as a whole.

Benefits and recommendations for improving traffic flow, cyclist safety and investment targeting

Applying this method to a comprehensive view of bicycle movement and accident rates in the city shows that the problems of bicycle traffic are not in the linear routing of bicycle lanes, but in the crossings and ramps from protected infrastructure into traffic.

This method offers a number of benefits for improving cyclist safety, not only in city of Hradec Králové. The identification of critical locations with a high risk of traffic accidents allows to update priorities for investments in infrastructure improvements at these locations.

By identifying these critical locations, safer and more efficient cycling routes that minimise the risk of accidents¹⁷ can be competently designed and promoted. This approach is in line with the smart city concept, where data is used to optimise urban services and infrastructure.¹⁸ Accident data can also be used for targeted education and safety campaigns for city residents. These campaigns can help raise awareness of road safety and contribute to a safer environment for all road users.

Identifying critical locations also allows for more efficient use of funds in those places where maximum benefit from investment can be achieved (SDG Goal 12 - Responsible Consumption and production).¹⁹

These locations can be measured repeatedly in the future, allowing targeted investment to be justified and its impact on traffic safety and flow monitored. This approach can lead to resource savings while improving the safety and comfort of cyclists.

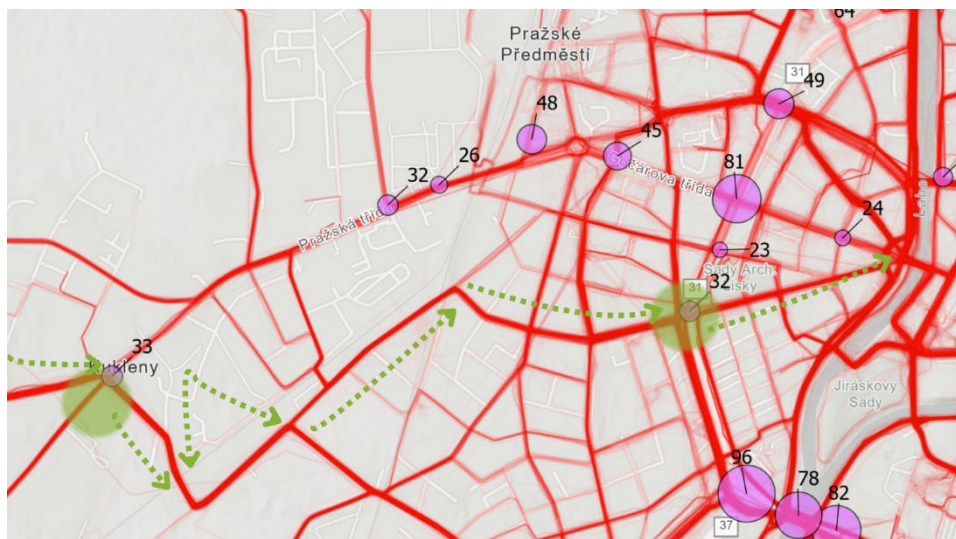


Figure 6. Design of the route connecting Kukleny and the city centre through the necessary attractiveness of the entire route from Kukleny towards city centre.

Limits of research

A fundamental prerequisite for replicating the research is the availability of accident data, trajectories of bicycle traffic movements, and ideally knowledge of the management of linear paths or protective measures for cyclists.

When conducting an analysis of bicycle traffic behavior in a city, it is important to consider several limitations. The first and fundamental limitation relates to data availability and quality. The analysis is dependent on the availability and quality of traffic crash and people movement data. If the data is not available or is incomplete, it may affect the results of the analysis. Problem is under reported number of cyclists accidents.²⁰

Another limitation is the geographical scope of the analysis. This analysis focuses on the city of Hradec Kralove, so the results may not be transferable to other cities or regions with different infrastructure, culture or demographics.

The complexity of cyclist behaviour is another factor to consider. Cyclist behaviour is influenced by many factors, including individual preferences, weather, topography and more.²¹ This analysis focuses primarily on infrastructure, culture, and demographics, but there may be other important factors that have not been considered.

The dynamics of the urban environment is another constraint. The urban environment is constantly changing and evolving,²² which means that the results of the analysis may be limited to a specific time frame and may not necessarily reflect the current or future situation.

Finally, the interpretation of data and analysis results can be subjective and depends on the expertise and experience of the analysts. Different analysts may interpret the same data in different ways, which may lead to different conclusions.²³

These limitations are important to consider when interpreting the results of this analysis. It is recommended that this mapping be taken seriously, as we must remember that the designation of critical locations is based on data from the Police Department. Therefore, not included are all those conflict situations that are resolved by agreement and the Police are not informed about them.

CONCLUSION

Research on the transport infrastructure in Hradec Kralove, with a focus on cycling, has identified critical locations that pose a risk to all residents of the city, including cyclists, pedestrians and individual automobile traffic (IAT). These places require clear urban planning and traffic safety intervention.

The results of the study provide the basis for further investigation and the design of remedial measures. The City of Hradec Kralove should take further remedial steps, especially in areas with expected increased congestion due to population growth, such as the Kukleny area.

The research also shows the main traffic flows of cyclists within the city and its western part and visualizes the traffic routes of cyclists in the city, with emphasis on comparison with the Police data on traffic accidents.

The use of this data provides effective method of identifying critical locations in cycling infrastructure, wherever in the world data sources are available. This data can provide valuable information for planning and improving cyclist safety, which also supports the fulfilment of the strategic points of urban transport development in times of climate crisis.

In conclusion, removing critical points for cycling infrastructure in a city is the cheapest and fastest way to motivate the population to switch from IAT to cycling in order to reduce the city's carbon footprint and increase the resilience of both residents and the city as a whole.

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HOUSING UNAFFORDABILITY WORSENING THROUGH MARKET-LED URBAN RENEWAL SCHEMES AS PROFIT-EXTRACTING MACHINES: COMPARATIVE PERSPECTIVES FROM LONDON AND TAIPEI

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INTRODUCTION

There is a dominant discussion surrounding the financialisation of urban development in current academic debates. While the definition of financialisation varies across different contexts, it is evident that these discussions can be identified in several specific areas. Among these discussions, the financialisation of housing and real estate is particularly urgent, as it involves debates about the financial instruments that lead to the ‘assetization’ of housing which involves the use of housing from the right to good for living into a fictitious product for financial investment. As a result, the intensification of the financial-turn in housing and real-estate development have raised serious issues such as the exacerbation of housing unaffordability and increasingly uneven urban development.¹

The ongoing ‘unaffordable’ housing market has become a global issue that requires urgent attention. For example, in London, Colenutt² details the complex relationships among landowners, house builders, bankers, and politicians that contribute to the housing emergency. Other discussions, such as those by Ferm and Tomaney,³ examine the issue through the lens of market-driven planning systems in the UK, highlighting the increasing importance of policy tools like Section 106 and viability assessments in creating feasible housing and planning developments. The growing reliance on private investments and financial instruments have resulted in the issues not only for housing affordability but also the quality of housing design and supply across the country.⁴

Meanwhile, the issue of housing affordability within the context of financialisation and market-led development has also become significant in East Asian developmental states. In Taiwan, Chen⁵ identifies the factors contributing to high housing prices, noting the intersection of strong state intervention and intensified market-led developments. Additionally, Shih and Chiang⁶ explore how the deployment of financial instruments, such as land-value capture approaches, has become a ‘politically less contested’ model in Taiwan. These discussions indicate that the financialisation of urban development is critical, particularly concerning issues of housing affordability and sustainable housing development.

With this broader context, the paper responds to the calls from Aalbers⁷ and Wu⁸ for more contextualised analyses of the financial turn in urban development to provide a more holistic

understanding of the ‘variegation’ of urban financialisation. We will develop a comparative discussion of London and Taipei, as evidence shows that these two cities share mutual connections through a long history of urban policy learning, particularly in the marketisation of urban regeneration initiatives.⁹ Additionally, both cities serve as important case studies for illustrating the changing roles of states and local governments within the context of urban financialisation. For example, Pike¹⁰ reveals the emerging form of ‘local statecraft’, in which local governments actively seek ways to fund urban infrastructure services following the 2008 financial crisis. In Taiwan, Yang and Chang¹¹ similarly highlight the neoliberalisation of developmental-state governance, indicating that local governments increasingly rely on profit-seeking through market-led urban developments.

This paper contributes to the debate of financialised state assets and housing affordability¹² with a specific focus on the role of urban renewal programmes in global cities. The comparison of two global cities, London and Taipei, brings in new insights on the institutional and political settings for public policy by utilising various planning tools to tackle the acute housing crisis in affordability faced by millions of residents in the capitals of England and Taiwan. Therefore, by adopting a comparative approach between London and Taipei, we aim to critically engage with the ongoing process of financialisation in housing. How do the policy rationalities and implementations are constructed and developed? How do the financial turns in urban policies influence the two cities? This paper seeks to provide an overview of the trends toward financialisation in housing in London and Taipei, examining the policy mechanisms and instruments enacted in this process and the potential impacts of such developments, such as gentrification and unaffordable housing. The structure of the paper is outlined in three parts: following the introduction, we will first introduce key policy debates surrounding housing affordability and financialisation in London, followed by a critical review of housing developments and relevant issues in Taipei, such as affordability and financialisation in housing. Finally, the paper will highlight the importance of conducting comparative work between London and Taipei and suggest future research directions.

FINANCIALISED STATE ASSETS AND HOUSING UNAFFORDABILITY IN LONDON

This section walks us through a narrative observing how housing in London has become incrementally less affordable, shaped by regeneration policy in the unintentional process of financialising state-owned assets within the planning system. From a perspective of descriptive policy analysis,¹³ we critique the impact of the planning tools employed primarily in the context of urban renewal programmes on the process of financialising state assets with implicit intention to facilitate the challenge of housing affordability in England with special attention on the case of London after the 2008 Global Financial Crisis.

The effect of financialisation has transmitted into state-led redevelopment programmes in housing which exacerbate the scale of housing unaffordability in global cities such as London. For example, Chng, Reades, and Hubbard¹⁴ discover that housing conversions in London under Permitted Development Rights (PDR) as a deregulation planning tool are less affordable per square metre than other new developments in the capital. They claim that this form of planning deregulation indirectly allows developers to extract maximum value and then profit from the schemes that are supposed to encourage building more affordable homes. Thus, it is critical to understand the policy perspective of housing affordability under the pressure of financialisation in the context of urban renewal.

Poon and Garratt¹⁵ note that the promotion of reusing brownfield land in regeneration developments saw little success in significantly increasing land supply for new houses that help resolve the problem of ‘housing crisis’ in affordability due to the time-consuming process of obtaining planning permissions and high costs for land preparation. They also observe that the affordability of housing for first-time

buyers deteriorated further following the financial crisis of the late 2000s. One of the attributes to measure the level of affordability is financial sustainability referring to homeowners' ability to financially sustain their purchase and this can be expressed in the form of repayment gearing between the income and mortgage payment. Poon and Garratt argue that one role of public policy in easing the pressure of increasing house prices lies in the possibility of providing more supply of land for new houses that lead to enlarging the existing housing stock and making housing more affordable.

Therefore, the achievement of 'affordable' house prices consequently helps house-owners become more financially sustainable in repaying their mortgage loans. However, the economic sustainability of housing affordability has not been evidently strengthened by housing policy in England since the 1980s due to the effect of the prevalent market-led approach adopted by governments supporting neoliberal ideology. For example, Christophers¹⁶ observes that public assets, particularly land, in the UK have gradually been privatized by transferring public land to private-sector actors and then financialised. Arguably, the removal of the first-look requirement for local authorities or housing associations to secure the 'surplus' sites through land release¹⁷ for the purpose of housing development does not assist the endeavour of supply-side housing policy in encouraging more houses to be built, thus making housing more affordable.

Concerning sustainability in London Housing, Chng, Reades, and Hubbard¹⁸ quote the study of Gallent et al.¹⁹ suggesting that the development of housing through PDR can result in unsustainable patterns of land use in the long-term because this prioritises the use for housing over other equally needed uses in affordability such as commercial or industrial units.²⁰ Thompson and Hepburn²¹ take the perspective of market sustainability²² by cautioning that urban renewal schemes should be protected against the privatisation of public land and subsequently the risk of squeezing out the provision of affordable housing. This outcome further affects its economic sustainability. Consequently, the pivotal way to measure the economic sustainability of housing affordability is to evaluate how public policy in urban renewal influences house prices or rents.

The review of urban renewal schemes suggests that the market-led approach to urban renewal schemes showcases the logic of 'financialised municipal entrepreneurialism'²³ in many cities such as London. It means that under neoliberal financialisation, the land value capture mechanism has not achieved the goal of delivering more affordable housing but conversely, it works against the public interest by privatising the public land and financialising state assets in England.

HOUSING UNAFFORDABILITY AND FINANCILISATION IN TAIPEI

Many scholars have identified that the institutions of urban renewal in Taipei have shifted from a state-led to a market-led model driven by economic interests since the 1990s. This shift is closely related to changes in legislative frameworks favouring market-driven approaches and the continuous increase in the granting of density bonuses to maximize both density and profit incentives.

Prior to the enactment of the Urban Renewal Act in 1998, urban renewal policies in Taiwan were regulated by Chapter Six of the Urban Planning Law, which focused on revitalising dilapidated areas primarily through land expropriation. However, after the new Act was introduced, the implementation of urban renewal projects became more akin to running a business and gradually aligned more closely with market mechanisms. According to Article 3 of the Act, only institutions, organisations, or renewal committees can initiate and act as implementers of urban renewal projects. Moreover, although the original renewal area was limited to districts designated in the Urban Planning Law, the Act expanded the scope by allowing smaller renewal units proposed by landowners or institutions, thereby increasing development opportunities.²⁴ As a result, Lan and Lee²⁵ observe that each urban renewal project is considered a 'business project'.

In addition, the new Act was influenced by Japanese policy implementations and incorporated the right transformation mechanism. The concept is to convert the ‘pre-renewal property value’ into the ‘post-renewal property value,’ allowing development profits to be distributed to landowners and developers based on the proportion of landownership they hold after deducting development costs. In other words, the right transformation mechanism enables landowners to be ‘protected’ by the post-renewal property value, preventing them from being evicted from their original neighborhoods.

However, to maximize the value after urban renewal, the original community owners are meticulous about the evaluation and allocation of the renewal value, leading residents to question the fairness of the value assessment procedures.²⁶ As a result, this undermines the original intention of the value conversion, which aims to reduce the impact of housing price increases after urban renewal. Lan and Lee argue that community residents are ‘inevitably’ shifting from a residential reconstruction mindset to a tool for capital accumulation and reinvestment under the logic of value conversion. With implementers (usually developers) and landowners both pursuing maximum economic benefits, urban renewal has transformed into a profit-driven business model and a tool for capital accumulation.

Indeed, as evidenced, another reason for the increasing housing unaffordability is the enactment of density bonuses in urban renewal. Shih and Chiang point out that to attract capital into old urban areas and facilitate urban renewal, the Urban Renewal Act allows for a maximum density bonus of up to 1.5 times the legal limit. In their research, interviews with officials from government planning departments reveal that the types of density bonuses are diverse, including time-based incentives, donations of public facilities, architectural design, urban disaster prevention, and smart buildings. The goal is to enable various urban renewal projects to achieve the maximum density bonus whenever possible. Implementers and landowners are rushing to apply for density bonuses in order to ‘find money’ and accelerate land commodification.

As a consequence, a study by Li et al. found that from 2010 to 2019, among the 423 urban renewal projects in Taipei City that applied for density bonuses, an average of about 800 ping²⁷ per project were granted. This resulted in over 600 million NTD²⁸ in increased housing prices and a total sales price of 258.7 billion NTD for the bonus density units. These substantial profits have spurred a real estate investment boom, contributing to housing injustice. We analyzed average residential unit prices for new housing development projects²⁹ in various administrative districts of Taipei City from 2012 to 2021 shows that projects applying for density bonuses in early development areas (Datong District, Wanhua District, Zhongzheng District) averaged 1.0133 million NTD per ping. In the same areas, projects without density bonuses averaged 989,300 NTD per ping, reflecting a 102.43% increase in residential prices for higher-density developments. In central districts (Daan District, Zhongshan District, Songshan District, Xinyi District), projects with density bonuses averaged 1.4238 million NTD per ping, whereas projects without density bonuses in these areas averaged 1.2170 million NTD per ping, showing a 116.99% increase in residential prices for higher-density developments. In the emerging outer districts (Shilin District, Neihu District, Wenshan District, Beitou District, Nangang District), projects with density bonuses averaged 859,800 NTD per ping, while projects without density bonuses in the same areas averaged 779,200 NTD per ping, indicating a 110.34% increase in residential prices for higher-density developments. This aligns with previous research findings that high-density urban development, while providing more and newer housing supply, actually results in more luxury or high-priced housing, leading to unaffordable housing prices despite the increased supply.

The latest house price data published on GOV.UK by HM Land Registry for May 2024 shows that the average house price in London is £523,376. It increased by 1.75 times, compared to £298,596 in Jan. 2008.³⁰ However, the house price to residence-based earnings ratio in 2008 in London was 8.52, over the “affordability threshold” of five. This threshold is a commonly used

benchmark in housing affordability studies, indicating that a ratio above five suggests that housing is unaffordable. Over the past fifteen years, house prices have continued to rise and are not proportionately earning growth. The Office for National Statistics (ONS) figures show that housing affordability in London is worse after the 2008 Global Financial Crisis, and the affordability ratio of London is above twelve in 2023.³¹ In the same period, the Sinyi- Taipei City House Price Index rose from 66.59 to 160.43,³² an increase of 2.41 times. The price-to-income ratio rose from 8.33 to 15.71.³³ These figures show that housing prices in these two cities have exceeded affordability. Moreover, the affordability issue of housing in Taipei seems more severe due to the steep increase in the rate between the two cities.

CONCLUSION

The issue of housing unaffordability is worryingly deteriorating and becomes a global phenomenon. The lessons learnt from the cases of London and Taipei shed a light on the shared outcomes of urban renewal schemes under the impact of financialisation. Firstly, regeneration policies in both cities have unintentionally financialised state-owned assets through legislative frameworks favouring market-driven approaches. Secondly, the added housing units under supply-side policy have not alleviated the pressure of the increasing housing price but on the contrary pushed up the price and made houses further unaffordable. These policy outcomes denote that urban renewal schemes not only fail to bring out the benefits to the public and communities but also incidentally enable profit-seeking developers to extract maximum value from these schemes. Following the principle of supply-demand theory in land and real estate market, housing price is supposed to decrease due to the new houses added to the existing stock initiated by urban renewal policies. Consequently, this effect should supremely improve the worsening issue of housing unaffordability. However, in reality, these policies maybe indirectly but have actively facilitated the process of financialising state assets through market-led urban renewal schemes as profit-extracting machines.

Both UK and Taiwan governments have embraced a market-oriented standpoint, which follows the rationality of financialised entrepreneurialism. The case of London demonstrates housing conversions under Permitted Development Rights (PDR) are as unaffordable as other new housing developments constructed by private-sector developers. Besides, the concern of this policy in the long-term is that this scheme could potentially threaten the disappearance of other critical land uses required for local businesses to acquire affordable working spaces.

Moreover, this neoliberalism ideology has transformed public policies for the purpose of housing development such as land release programmes enacted by local governments to hand over 'surplus sites' to private developers who exploit the extra value from 'speculative opportunities' created by relaxing planning regulation since the 1980s. This trend has been witnessed in Taipei. The right transformation mechanism initiated under the Urban Renewal Act intends to condense the increase of housing price caused by urban renewal with an intention to convert the 'pre-renewal property value' into the 'post-renewal property value'. However, due to pursuing maximum profits, this urban renewal scheme inevitably falls into a profit-driven business model and failed to capture the benefits of this 'value conversion mechanism'.

The discussion of 'affordable' house prices and rents is fundamental to investigate the method in determining housing affordability both in London and Taipei. It is evident that in London, urban renewal schemes discussed above have not promoted financial sustainability and thus weakened the capacity of the house-owners to make their mortgage repayments. The findings of several studies about the effect of density bonuses endorsed by the Urban Renewal Act repeat the same story regarding housing affordability and financial sustainability. These high-density urban developments generate more luxurious but unaffordable houses in Taipei.

This paper makes a contribution in enriching our understanding of financialised state assets and housing affordability. We have outlined the key developments and insights toward financialisation in housing framed by urban renewal policies in London and Taipei to dampen the challenge of housing unaffordability. More research and empirical evidence are required to uncover the casual relationship between urban renewal policy and housing affordability under the grasp of market-led approach to financialize state assets. For example, it will be interesting to examine the extent of housing price increases promoted by these urban renewal schemes in London and Taipei after the Global Financial Crisis in 2008. Furthermore, there is little understanding associated with the role of the stakeholders involved within urban renewal policies who are the paramount actors to facilitate the process of financialising the state-owned land and properties.

NOTES

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²⁸ NTD means New Taiwanese Dollars. One US dollar is roughly 32 NTD. One GBP is roughly 41NTD.

²⁹ This analysis builds on two data sources. First, a building use permit data set contains records of all development projects approved for construction and completed for use from 2012 to 2021 in Taipei City. Each record includes information on every development project's site area, total floor area, location, zoning status, number of apartment units built, year of construction, use permits issued and density bonus remarks. Second, the housing price data set is maintained by the Cathay Real Estate Development Corporation, is the first stock-listed company in the construction industry. And which publishes "Cathay Real Estate Index Quarterly Report" since the end of 2002 until now.

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EXAMINING THE SPONTANEOUS SPATIAL TRANSFORMATION OF ICUs DURING THE COVID-19 PANDEMIC: A STUDY ON THE DYNAMICS OF NURSE-PATIENT INTERACTION FOR FUTURE PANDEMIC PREPAREDNESS

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INTRODUCTION

The global pandemic sparked by the 2019 novel coronavirus swiftly spread from China to other regions in late December 2019,¹ prompting the World Health Organization to declare it a global crisis. This pandemic exposed vulnerabilities in healthcare systems worldwide and highlighted the need for strategic spatial transformations in ICUs to accommodate critically ill patients.²

The challenges faced during Covid-19 in hospitals provide valuable lessons for future pandemics, emphasizing the need to analyse their effects and transform these lessons into insights for better preparedness. The pandemic posed unique challenges in ICUs, prompting hospitals to rapidly adapt to accommodate critically ill patients, highlighting the need for strategic spatial transformations in planning critical care settings³ Interventions focused on increasing ICU capacity, ensuring infection control, organizing new patient rooms, providing additional respiratory devices, creating isolation rooms, and improving air circulation to enhance patient and healthcare staff safety by reducing infection risks. The crisis underscored the importance of strategic action plan and resource allocation to effectively respond to outbreaks and ensure continuity of routine healthcare services.

Surge capacity refers to healthcare service's ability to expand beyond regular limits in response to increased demand, with action plans aiding in Covid-19 response while maintaining primary healthcare.⁴ Surge capacity includes potential patient beds, available space, personnel, essential medical supplies, and even the capability to provide healthcare beyond authorized capacities, as defined by the Joint Commission on Accreditation of Healthcare Organizations.⁵ Supplies, staff, space and putting them into the context with system and procedures created a comprehensive approach to manage surge capacity.⁶ Therefore, an efficient response plan depends on the accurate functioning of all these intertwined components.

During intensive efforts to meet ICU surge capacity, communication between ICU nurses and critically ill Covid-19 patients is crucial for regular follow-ups and rapid interventions. Accordingly, the hypotheses of the study are:

1. Spatial interventions focus on the patient bed space, emphasizing the importance of direct contact and communication with the patient.

2. Infection control measures in the patient bed space negatively affect communication between ICU staff and Covid-19 patients to some extent.

Based on these hypotheses, this study aims to develop a spatial design strategy that supports effective patient-nurse communication in adaptable ICU settings, specifically for future respiratory pandemics. The study involves understanding spatial challenges faced during Covid-19, and analysing communication strategies used by ICU healthcare staff, via gathering their feedback about the Covid-19 process. The overall objective is to draw insights from the pandemic experience and explore spatial interventions implemented during emergencies, offering practical solutions for designing patient bed spaces that enhance patient-nurse interaction and can be adjusted for future respiratory pandemics.

ICU DESIGN CRITERIA

To comprehensively address the physical changes in the ICU due to spatial transformations related to Covid-19, the study first analysed factors affecting the entire ICU and ward areas where treatment occurred. Then, it focused on spatial components that directly or indirectly affect communication between ICU nurses and patients around the patient bed space, the unit of analysis. In this context, the study examined how these forms of communication transformed during an emergency outbreak (Figure 1).

Figure 1. ICU Design Criteria (Celebi and Tanriover, 2024)

Gharaveis et al.⁷ identified unit configuration (spatial layout), visibility patterns, and accessibility as key elements in healthcare design influencing teamwork and communication. Unit configurations are classified as centralized, decentralized, and hybrid based on nursing station type. Nazarian et al.⁸ suggested that centrally locating the nursing station within the ward improves access to patient areas, treatment rooms, staff rooms, and isolation rooms. Lu et al.⁹ found that visibility patterns, including the patient's field of view and proximity to the nursing station, influenced mortality rates. Additionally, Hadi and Zimring¹⁰ demonstrated that improved patient visibility, achieved through corridor design and shorter travel distances, can decrease mortality rates. Different alternatives for ward areas were developed considering both visibility and easy access parameters in the design of ICUs: single rooms, double rooms, multi-bedded rooms and single rooms have been associated with increased staff stress¹¹, longer travelling distances, more steps per nursing shift,¹² and staff feelings of isolation and difficulty in seeking help from colleagues.¹³

Patient Bed Space and Nurse-Patient Communication Forms in ICU

In ICU design, patient bed space is crucial as it serves as a recurring area characterized by specific physical environmental features where nursing activities are most concentrated. Bed space is not just a treatment area, but also where critical patients are observed, cared for, and treatment plans are made based on factors like length of stay and type of treatment¹⁴. Therefore, the patient bed space is the most active place where the nurse interacts with the patients and investigating communication challenges during emergencies like Covid-19 is crucial for ensuring the continuation of effective care.

Although the patient is under constant observation and monitoring, if the ICU staff is not in contact with the patient through different forms of communication, the patient's sense of security cannot be achieved.¹⁵ Communication, which means "simultaneously talking and/or signalling non-verbally, listening and/or observing non-verbal signals, thinking, interacting, planning and responding", is mostly used by ICU staff through visual, auditory, and tactile means.¹⁶ Communication is generated through the signals, gestures, messages and contacts given to the patient with difficulty in communication. Qualitative studies on ICU patients who are unable to speak due to mechanical ventilation show that communication challenges trigger emotions like anger, frustration, panic, anxiety, and insomnia.¹⁷

Visual communication in the ICU patient room plays a significant role in facilitating communication between patients and staff, influencing critical patient visibility and monitoring. The aim is both to guarantee maximum observation on patients and to reduce the total walking distances of nurses.¹⁸ The layout of nurse stations within the unit / ward affects the ability to observe patients efficiently, with a shift towards patient-centres designs and decentralized workstations for more integrated care processes.¹⁹ The study comparing different ward configurations highlighted the importance of global visibility (unit with centralized nurse station) and efficient visual communication strategies for optimizing patient care and satisfaction.²⁰

Auditory communication is essential in ICU settings, playing a crucial role in the medical care process and patients' mental well-being, with communication failures posing risks in critical patient care.²¹ Minimising high noise levels for healthy auditory communication is critical to prevent potential misunderstandings and disruptions in care.²² Similarly, ICU staff working in a noisy environment may be inclined to underperform due to inattention or mental fatigue.²³ The Covid-19 disrupted auditory communication in ICU setting due to the use of PPE, especially face masks, to ensure infection control in turn has led to communication limitations and the adoption of hand signals as an alternative auditory communication method in patient interactions.²⁴

Tactile Communication plays a significant role as non-verbal touch can provide comfort, reassurance, and acceptance to patients who may struggle to verbally communicate their needs.²⁵ Despite the demanding nature of ICU nursing, tactile communication is seen as a vital form of care for critically ill patients, particularly for those experiencing isolation. If the design and functional features of the nurse station support behaviour and satisfaction, tactile communication can be improved through more patient visits and therefore the quality of care can also increase.²⁶ The Covid-19 pandemic posed challenges to tactile communication due to increased workload, protective measures like PPE compliance, and the need for clinical focus, leading to limited patient communications and necessitating a heightened emphasis on non-verbal touch to support patients emotionally.²⁷

THE CASE

Setting

The Reanimation and Anaesthesia ICU at Istanbul Training and Research Hospital are situated on the ground and first basement floors, with a total capacity of thirty beds for second level and third level critical patients. During the pandemic, the ICU capacity was increased to thirty-nine beds by converting the basement operating room into a seven-bed patient room and the ground floor nurse's room into a

double-bed patient room. This study analysed the ICU on the ground floor, which was used exclusively for third level Covid-19 patients during the pandemic.

Participants

A pre-interview with ICU specialist Dr. Ayşe Nur Soytürk was conducted on April 15, 2022, and observations were made on the ground floor third level ICU for Covid-19 critical patients. Then, in-depth interviews with two ICU specialist nurses who worked during Covid-19 were held on October 12, 2022. Lastly, a questionnaire was distributed to eleven volunteer nurses from this hospital who contributed to the ICU during Covid-19 in October 2022. Among the respondents, seven (63.6%) were aged 21-30, three (27.3%) were 31-40, and one (9.1%) was 41 or older. Of these nurses, seven (63.6%) were female and four (36.4%) were male. Educationally, two (18.2%) had an associate degree, eight (72.7%) had a bachelor's degree, and one (9.1%) had a master's degree. ICU nurses worked an average of forty-five hours per week.

Data Collection Methodologies and Procedure

This study involved a semi-structured pre-interview with an ICU specialist to understand spatial transformations and interventions in the ICU. Observations were made to assess the physical characteristics of the ICU space and determine how it is used. Additionally, in-depth semi-structured interviews and a questionnaire were conducted to nurses, to investigate communication between ICU nurses and critical patients around the patient bed space (Figure 2).

Figure 2. Schematic View of Procedure, (Celebi and Tanriover, 2024)

A Pre-Interview with an ICU Specialist Doctor

A pre-interview with an ICU specialist doctor was conducted to understand treatment protocols and their impact on spatial practices during Covid-19, in relation to ICU design criteria from the literature review (Table 1). This data provided insights into spatial transformations and key elements for observation. During the pre-interview, unit configuration, space dividers, and patient bed space were examined as main categories.

Observations

Observations were conducted to gather information on ICU use and the spatial dimensions of communication between ICU staff and patients. Data from the pre-interview with the ICU specialist helped develop the main and subcategories for the "Observation Record and Control Table," which

guided the systematic collection of data and was evaluated with regard to the architectural plan layout. Unit configuration was analysed in terms of size, capacity, plan layout, and human-centred design. Space dividers were examined for material, visual, and auditory permeability. Bed space analysis focused on patient bed positioning, visibility of the nurse's desk, and placement of monitoring and medical equipment, considering the communication between ICU nurses and patients (Table 1).

In-depth Interviews with ICU Nurses

In-depth interviews with ICU nurses were conducted to understand their experiences with the ICU physical environment during Covid-19 and analyse communication difficulties in patient care. Compiling and analysing information on the ICU's physical characteristics is crucial for understanding components affecting the patient bed space. The study used three communication forms (visual, auditory, and tactile) from the literature review as main categories and examined subcategories related to the effects of spatial interventions during Covid-19 on these communication forms (Table 1). The interviews, lasting 40-50 minutes, were conducted with two nurses who worked in the ICU during the pandemic.

Questionnaire for ICU Nurses

Questionnaire for ICU nurses start with the 'Nurse Introduction Form,' which gathers demographic information such as age, gender, working time, weekly hours, and the number of patients cared for daily.²⁸ The main section includes twenty-five questions analysing communication between ICU nurses and patients through visual, auditory, and tactile forms, as well as the frequency of digital patient monitoring and nurse station usage during Covid-19 (Table 1). The study employs a five-point Likert scale developed by Rensis Likert in 1932,²⁹ with responses ranging from 'strongly agree' to 'strongly disagree.'

			Observation (Observation Record and Control Table)	Interviews		Questionnaire
			Through Architectural Plan	ICU Doctor (pre-interview, semi- structured interview)	ICU Nurse (in-depth, semi-structured interview)	ICU Nurse
Unit Configuration	Size and Capacity		Capacity of Bed and Size of Bed Space Architectural Program (within unit and relation with necessary department) Flexibility for Surge Capacity	Capacity of Bed Surge Capacity during Covid-19 Flow of ICU staff during Covid-19 Spatial Transformation Process		
	Spatial Organization		Nurse Station (centralized, decentralized, hybrid) Patient Room Types (single, double, ward areas with multi-bed, isolation) PPE Donning Doffing Zone Separation of Covid patients from non-Covid patients	Ward Areas with multi-bed Central Nurse Station Decentralized Nurse Desk		
	Lighting and View		Natural Lighting Patient Bed Orientation Staff Rest Area	Natural Lighting Patient Bed Orientation Staff Rest Area		
Space Dividers	Material and Permeability		Fixed or Mobile Visual and Auditory Permeability	Revision or Addition of Space Dividers Infection Control Visual and Auditory Permeability		
Patient Bed Space	Com. Forms	Visual Audial Tactile		Caring Routine during Covid-19 Digital Technologies during Covid-19 Use of Nurse Station	General communication and workflow Nurse station Ward areas with multi-bed Surge Capacity Space dividers Digital monitoring of the patient	General communication and workflow Nurse station Ward areas with multi-bed Surge Capacity Space dividers Digital monitoring of the patient

Table 1. Design of Research Methods, (Celebi and Tanriover, 2024)

Data Analysis

Data collected via observation was recorded in the 'Observation Record and Control Table,' with notes and categories re-evaluated based on ICU architectural plans. These observations and data were then transferred to abstract schemas for the findings section. Qualitative data from interviews were analysed in three stages: coding, categorization, and interpretation³⁰, ensuring data integrity, meaning, and reliability, and validating codes through emphasis and frequency.³¹ Non-parametric statistical analyses were performed on the questionnaire data using SPSS.

FINDINGS

Observation and Pre-Interview with ICU Doctor: Plan Layout

■■■■■ nurse desk

Figure 3. ICU Plan Layout before Covid-19, (Celebi and Tanriover, 2024)



Figure 4. ICU Plan Layout during Covid-19, (Celebi and Tanriover, 2024)

Comparing the original plan (Figure 3) with the Covid-19 transformed plan (Figure 4), it was observed that the ward areas lacked flexibility for expanding bed capacity, and the staff restroom was converted into a double-bed patient room. During the Covid-19 period, isolation rooms maintained negative pressure with designated donning and doffing buffer zones at entry and exit points. Challenges in segregating Covid-19 and non-Covid-19 patients led to delays and inefficiencies. Health and human-centred design considerations showed that while all ward areas faced the window, patients near the door received less light due to bed positioning. The nurse's room outside the ICU served as a rest and interaction area, and a new staff entrance connected to the courtyard provided a relaxation space. In ward areas, fixed aluminium panel partitions hindered visual communication, yet curtains allowed for visual and auditory permeability. Also, distances between patient beds were compliant with regulation

but insufficient in emergencies. The analysis also highlighted varieties in nurse desk locations in relation to patient bed position.

Interviews and Questionnaire with ICU Nurses: Communication Forms

In this section, in-depth interviews with ICU nurses and questionnaire results are evaluated together (Figure 2). Due to the low number of questionnaire participants, only questions with the highest or lowest scores are included. According to the nurses, the shortage of ICU staff increased their workload and reduced one-to-one patient contact. Additionally, a twenty-four-hour shift system was adopted to minimize travel and transmission risks for ICU staff.

Nurses reported that while close contact with patients in ward areas was maintained through PPE, monitoring vital signs via the central nurse station and intervening immediately was preferred during Covid-19. Question four (4.81) received one of the highest scores, highlighting the increasing importance of the central nurse station in emergency situations (Table 3).

Descriptive Statistics			
	N	Mean	Std. Deviation
General Communication	11	2,0909	1,86840
Nurse Station	11	3,5909	,62523
Visual Communication	11	2,8636	,54902
Auditory Communication	11	2,3273	,57461
Tactile Communication	11	2,6136	,37689
Infection Control	11	3,4545	1,80907
Valid N (listwise)	11		

Table 2. Descriptive Statics Related to Dimensions, (Celebi and Tanriover, 2024)

Impacts on Visual Communication

The multi-bed ward areas allow nurses to observe all patients from the nurse desk simultaneously and intervene immediately in emergencies. The highest questionnaire scores (4.72 and 4.09) were for questions (Question five and Question seventeen) related to visual observation of patients and rapid intervention in emergencies (Table 3).

ICU nurses reported that patient interaction time decreased due to surge capacity, although questionnaire results showed no significant decrease. Space dividers in ward areas provided privacy during critical care while maintaining limited visibility in normal situations. However, intubated Covid-19 patients' vision was limited to the front. Centralized monitors allowed remote patient monitoring, giving visual access to the patient even when nurses were at the computer, but they could not communicate with the patient. According to nurses, during severe pandemic situations, patients needed more visual communication, emphasizing one-to-one visual contact with the nurse.

Impacts on Auditory Communication

Space dividers in ward areas allow sound to pass through, enabling auditory communication between ICU nurses and patients. However, ICU nurses emphasized the importance of spatial measures to mitigate disturbances and inaudibility caused by high noise levels. Auditory communication between patients can support them in positive situations but cause concern in negative ones. Additionally, overlapping PPE such as bonnets, goggles, visors, and masks, used to prevent transmission, were reported to reduce auditory communication.

Descriptive Statistics			
	N	Mean	Std. Deviation
Q1	11	2,091	1,8684
Q2	11	3,182	1,6011
Q3	11	2,364	1,2863
Q4	11	4,818	,4045
Q5	11	4,727	,4671
Q6	11	3,545	1,2136
Q7	11	3,091	1,2210
Q8	11	1,727	1,6181
Q9	11	1,909	1,5783
Q10	11	1,545	,6876
Q11	11	1,909	,8312
Q12	11	1,727	,9045
Q13	11	2,364	1,3618
Q14	11	3,364	1,2060
Q15	11	2,182	1,3280
Q16	11	2,545	1,5076
Q17	11	4,091	,9439
Q18	11	1,545	,9342
Q19	11	1,909	,9439
Q20	11	2,455	1,5725
Q21	11	2,182	1,2505
Q22	11	2,455	1,5076
Q23	11	3,545	1,1282
Q24	11	3,455	1,6348
Q25	11	3,455	1,8091
Valid N (listwise)	11		

Table 3. Descriptive Statics, (Celebi and Tanriover, 2024)

Impacts on Tactile Communication

Although ICU nurses were initially hesitant to touch patients due to infection risk at the beginning of the Covid-19 period, they eventually overcame this and performed all necessary physical interventions despite the increased number of patients. However, regular routine visits to patients were shorter during Covid period.

Effective interventions were achieved through the cooperation of multiple ICU nurses when multiple patients needed simultaneous care in ward areas.

ICU nurses reported that a bed space of one and a half meters was sometimes insufficient, especially when using additional equipment like ventilators or dialysis devices, or during emergency interventions. They emphasized that adequate space is critical for patient safety and effective teamwork.

According to ICU nurse responses, while multilayered PPE hinders auditory communication, it allows nurses to touch patients without anxiety. Digital monitoring has influenced patient visits by enabling ICU nurses to assess patient severity before physical contact. Questionnaire responses to questions

twenty-three (3.54) and twenty-four (3.45) indicated that digital monitoring reduced tactile communication during the Covid-19 period (Table 3).

CONCLUDING REMARKS

This ongoing study was conducted during the period when Covid-19 was in remission in ICUs and the risk of transmission due to vaccination was reduced. However, in this period, reaching a small number of participants due to the transfer of many ICU nurses working during the pandemic either to their own departments or to other ICUs is seen as a limitation of the study. ICU nurses stated that direct communication with patients is one of the most important elements they want to preserve during Covid-19. In this study, which focused on the spatial dimensions of communication forms around the ICU bed space, it was found that multi-bed ward areas and central nurse desks are more convenient for patient observation and encourage communication with more patients, as long as infection control measures are applied. Despite the importance of patient monitoring with digital monitors for this period, it was concluded that it is much more valuable to enter the wards and follow the patient closely. For future pandemics, providing nurses with ward areas that they can easily access with minimum walking distances, arranging the patient bed space in terms of efficient execution of communication forms, and making unit / ward organisation that allows maximum visibility can contribute to patient care by facilitating communication between the ICU nurse and the patient.

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COMMUNITY MANAGEMENT AND NEIGHBOURHOOD RELATIONS IMPACT OLDER PEOPLE'S MOBILITY IN CHINA'S HIGH-DENSITY COMMUNITIES—AS AT ZHENGZHOU NO. 3 COTTON TEXTILE FACTORY

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INTRODUCTION

Following China's shift to a socialist market economy, the management of state-owned factories transitioned from a unit system to a community system after the bankruptcy of the state-owned factories. The unitary system refers to regional social units based on industrial relations that are dependent on work units for funding, infrastructure and community culture.⁰ After the 1990s, most minor units and primary-level governance systems of China in urban areas began to shift from the unit system to the community system⁰ The bankruptcy of these work units led to partial redevelopment in the community, with funding delays and limited space hindering age-friendly upgrading of communities. This study used walking interviews to explore the perceptions of older people in the Sanmian Community of Zhengzhou and to identify the unique characteristics of ageing-friendly environments.

METHOD

Fourteen participants were recruited through community posters based on residence status (living with family, spouse, caregiver, or alone), health status (illness limits activity), and gender. Each variable included one male and one female, for a total of 14 individuals. These variables were chosen for their potential impact on movement routes, memory, and comprehension. The residence status was chosen because of the intergenerational differences in emotion and caregiving support, reflecting the unique family culture in China.⁰ Disease status affects cognitive decline,⁰ and gender affects visuospatial working memory and navigation strategies.⁰ To ensure that the collected data included all the views, after completing 14 interviews, the authors continued until no new content emerged, resulting in 21 walking interviews, which were analyzed using thematic analysis through Nvivo. This study focuses on young-old who can move independently and excludes old-old. Four themes emerged finally:

Dynamic Management

This theme reveals the immediacy of communication with older people facilitated by CPMSC authorities.

A trusted mediator

The most mentioned sub-theme was the CPMSC's role as a mediator. CPMSCs are outposted organisations of government providing party policy consultation, affairs handling, and services, which including education, medical care, and elderly assistance, strengthening Party-government-grassroots connections.⁰

This sub-theme addresses conflict resolution within the community. The CPMSC coordinates and supervises age-friendly environment management. Participants report difficulties to the CPMSC, which then coordinates solutions. As the most recognised mediator for the participants, the CPMSC enforces service-oriented policies and encourages feedback, ensuring timely information and humane management. While issues remain, participants attribute them to system problems, not poor service. All participants think CPMSC's active coordination and goodwill enhance confidence to age in place.

Adjustments on the go

Another frequently mentioned sub-theme was making adjustments on the go. Timely access to resident information allows the CPMSC to make humane management decisions that may conflict with existing regulations but are in the community's best interests. The CPMSC formulates flexible policies based on residents' living conditions. For instance, city peddlers on Xiangrong Street (Figure 1), participants mentioned that were previously banned due to street occupancy, were allowed post-epidemic due to the dismal job market in China. Participants always get lower food prices than those in grocery shops, which helps reduce financial pressure.

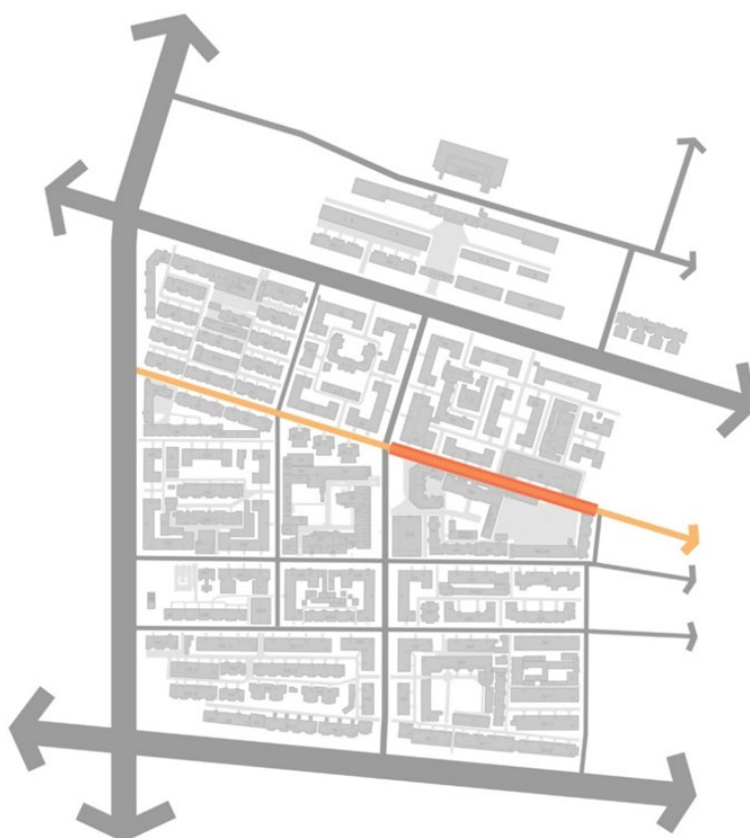


Figure 1. Xiangrong Street location

Information notices

This sub-theme concerns information dissemination within the community. Grid leaders use WeChat group chats and telephone notifications to inform older people about events, projects, and welfare services. In addition, the acquaintance informing complements WeChat by providing information on community activities and price changes, especially for non-smartphone users.

Participation in development

This sub-theme addresses participation in community decision-making. Only one participant reported being involved in a decision-making meeting, while others needed more opportunities and information about projects. Despite this, they had ideas about an ageing-friendly environment and were willing to be involved.

Most 1950s Soviet-designed houses and the No.3 STF administration building are fenced off to construction as tourist attractions, including a Textile Museum and a range of recreational facilities. Participants were more concerned about additional retirement facilities and public spaces and felt the CPMSC's public notices needed to have been clearer about the project.

The welfare system and its supplementary resources

This sub-theme addresses the use of social welfare for older people in the community. The transition from the unit system to the community system of service-oriented management led to reduced benefits due to delayed project funding and government financial constraints, delaying social support. The most frequently mentioned service was door-to-door blood pressure monitoring and auscultation by CPMSC staff. Variability in benefits exacerbates anxiety among participants living alone and in poverty. The CPMSC's grid-based system assigns each staff member as a grid point leader, providing one-on-one assistance. However, limited Grid Leaders can only help with some difficulties, leaving older people to adapt and await further support.

Participants established timely communication and support mechanisms with grid leaders, compensating for weak social welfare. Grid leaders volunteer work for old, which enhances participant trust in CPMSC staff and increases confidence in the community. They praised home visits by grid leaders. However, they feel despair about the volunteer jobs offered by grid leaders. They appreciate the visits but feel stressed when they take volunteer help from grid leaders. With increasing physical limitations, even young-olds feel burdened by their households. They feel frustrated being last considered for public welfare service by the local government.

According to the Regulations on the Work of Providing Support⁰ for the Five Guarantees in Rural Areas, the system targets older people, persons with disabilities, and minors in villages who are incapable of working, have no livelihood, and have no legal support obligor or an incapable one.

Cost

This them to what older people pay for their old age, including time, money, and other expenses.

Bread and butter

This sub-theme addresses the main conflict in aging in place regarding living expenses. Pensions are needed to cover personal living expenses and sometimes to subsidize family expenses with low pensions. Family incomes are pooled to maintain households, with participants subsidizing children's expenses to maintain their position in the family. However, their income is almost exclusively from pensions, and there is no job for healthy older people since employing older people violates laws. The pension increases are insufficient to cope with rising prices. So, participants emphasized the need to strictly control their spending to maintain life's basics, frequently evaluating the value of goods and

food. Their low-risk financial situation necessitates protecting their health and safety to avoid additional costs and burdening their children.

More seriously, no barrier-free modifications have been completed in the community. With the current policy requiring residents to pay for assisted living facilities with government subsidies. The installation costs are unaffordable for many neighbours, so much so that participants will have to wait to see if public funding is available in the future.

Extended space

This sub-theme reveals the cost of space needed for living in participants' lives. The community residential building is the staff welfare housing built by the No.3 STF. These flats are all small in size. In the later stages of life, it cannot carry all the contents of the residents' lives. Many residents use streets as supplementary spaces, such as hanging clothes out, potting, parking, and storage. That has also led to the problem of pedestrian traffic being squeezed out of the pavements and mixed with vehicular traffic when the streets are extensively occupied. Secondly, encroachment on the street also reduces the connectivity of the street for walking. The spatial interventions in the street were one of the participants' most current areas of concern. However, the residents encroached upon the street space in another way, which will be introduced in the next theme. The ideas of spatial intervention came from the participants around removing obstacles that encroach on the pavement and increasing walking quality, movement opportunities, safety, and the amount of space available.

Selectiveness

This sub-theme covered the optionality of resources needed for older people's lives. Participants often mentioned going to different shops and the reasons for doing so. Participants are very aware of the spending options within the community. The living infrastructure is centred on Xiangrong Street, including the staff hospital, restaurants, supermarkets, and administrative services. During the interviews, participants repeatedly mentioned the comprehensive availability of life supplies and medical services in the community, as well as the fact that life in the community was not impacted during the epidemic lockdown. In terms of availability, the number of grocery shops and restaurants in the community is substantial, and the abundance of choices available was also evidenced in the interviews. Medical resources are also readily accessible, with a pharmacy within a five-minute walk, a community-level staff hospital, and a municipal general hospital within a 15-minute walk (Figure 2).



Figure 2. Layout of the 15-minute living circle for the Sanmian East Community

Group creativity

This theme shows how older people are influenced by their positions in different organizations. Durkheim⁰ distinguishes between mechanical groups, based on evident characteristics, like familial and tribal traits, and organic groups, formed through self-invested associations. In this theme, all groups are organic, including social relationships, friendships, volunteer groups, and interest groups involving older people. Active participation in these groups helps maintain self-efficacy and reduces age-related decline.⁰

Tasks within family

This sub-theme addresses the tasks older people take on after retirement. In the Chinese cultural context, older people shift from work as their primary task to focusing on family matters after retirement. Older people must assume caregiving duties if grandchildren or spouses need care until their children or other guardians can take over. The personal life of participants begins once there are no family members who need care. These responsibilities also influence the paths and areas of older people's daily outings, often centring around activities near schools and hospitals.

Social group support

This sub-theme focused on the social groups of older people. The participants had their social groups within the community, and the emotional support from this contact motivated them to walk in the community. The manner and location of their gatherings determined their range of activities. Meeting the community boosts participants' confidence in aging in place despite the lack of accessible facilities

in residential buildings and public spaces, such as lifts. They try to overcome these physical obstacles by use self-made tool to stay connected to the social groups. The willingness to stay here with a strong attachment to a place was emphasised many times in the interviews.



Figure 3. The community public space

The participants think the familiarity was mainly with people and secondarily with the physical environment. Changes in daily travel scope made it hard to socialise. The retired older people of the No.3 SCTF Participants found it difficult to understand others if they needed a life context of the same type of career. Thus, their social group is stable and closed; all members of their group live and serve in No.3 SCTF. The personal time of participants in the community is scoped around social groups.

Participants with disabilities are segregated from non-disabled groups due to accessibility issues. They organize community groups in barrier-free locations outside their community, such as integrated parks. Unlike their non-disabled counterparts, older people with disabilities in the community do not engage in recreational activities but are limited to survival support.

The relationship between the participants and their social groups is mutually beneficial in meeting emotional needs and being the daily look-after to each other. Older people with significant medical problems can move and think independently and are considered a safety risk if living alone. CPMSC supervises those without family support, while others are placed in the family. Participants come together daily to provide emotional support and care to each other in the community.

Retailer-related

Participants felt that familiarity with shopping also led to a better experience and increased trust, subsequently motivating older people to choose the same shop consistently. Participants consider their relationship with retailers as a reason for shopping. They mentioned that over 40 years, relationships between older people and retailers have become transactional and social. Unlike friendship, this relationship is built on trust. If trust is broken, older people avoid those shops. Sharing shopping information Spread among acquaintances further impacts sale volume. Older stores maintain good reputations and relationships, integrating into the community.

Impact of multiple identities on community participation

This theme examines the impact of identity on community participation. Party members are obliged to volunteer in the CPMSC, with the honour of membership boosting their participation. However, this deters non-party member participants, who need more community support to identify with activities, leading to lower participation. Participants find public activities homogeneous, encompassing hobbies, social identities, and peers, with non-party groups often participating in pairs.

Space allocation

This theme concerns the impact on spatial quality due to the distribution of neighborhood space benefits.

Sensory experience

This sub-theme examines the sensory experience of high-density communities and its impact on participants' quality of life. The too-compact layout encourages walking (Figure 4) but will cause security risks and space resource conflicts among neighbours. While proximity to amenities is conducive to walking, noise and smells from retailers are a significant concern. Still, participants saw the noisy environment as a sign of community vitality.

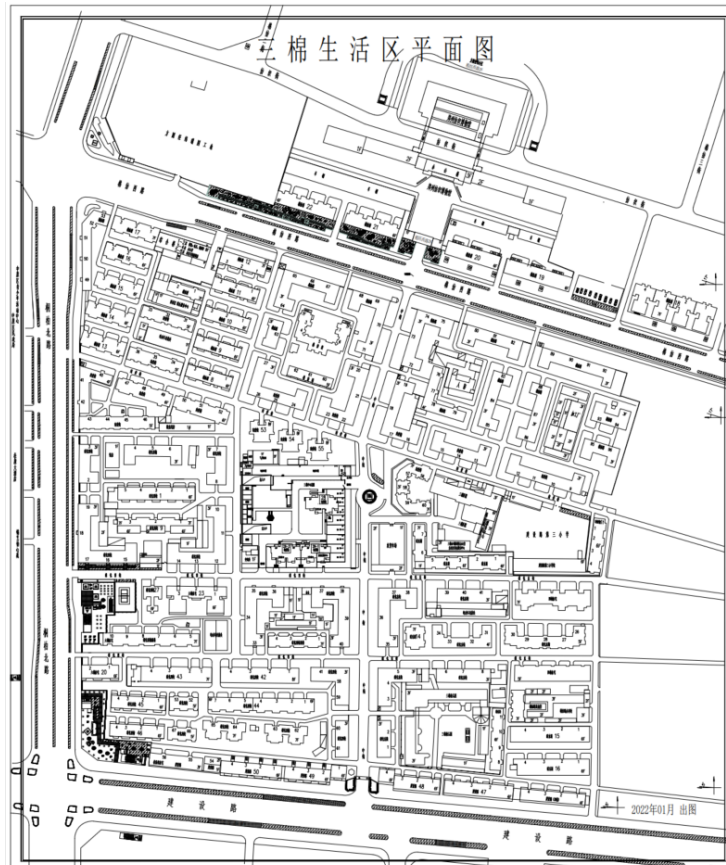


Figure 4. Layout of the Sanmian Communities

Functional space vs social space



Figure 5. Facilities around Xiangrong Street

There are two kinds of gathering spaces for participants: public spaces for activities (Figure 5) and self-created spaces within neighbourhoods and supporting infrastructures like large parks and community colleges outside the community. The community senior college aligns with the 14th Five-Year Plan for the National Development of Ageing and the Elderly Service System⁰ for senior education. Embedding senior education facilities in the community demonstrates the popularization of senior education. Ample parks and comprehensive facilities within a 15-minute living circle compensate for a high-density community's lack of public space. However, accessing these facilities requires crossing streets, increasing safety risks and limiting activities based on physical abilities. Less mobile participants exercise within the neighbourhood, while more mobile participants use out-of-neighbourhood facilities. Interviews showed similar activity ranges for participants at certain physical levels (Figure 6).

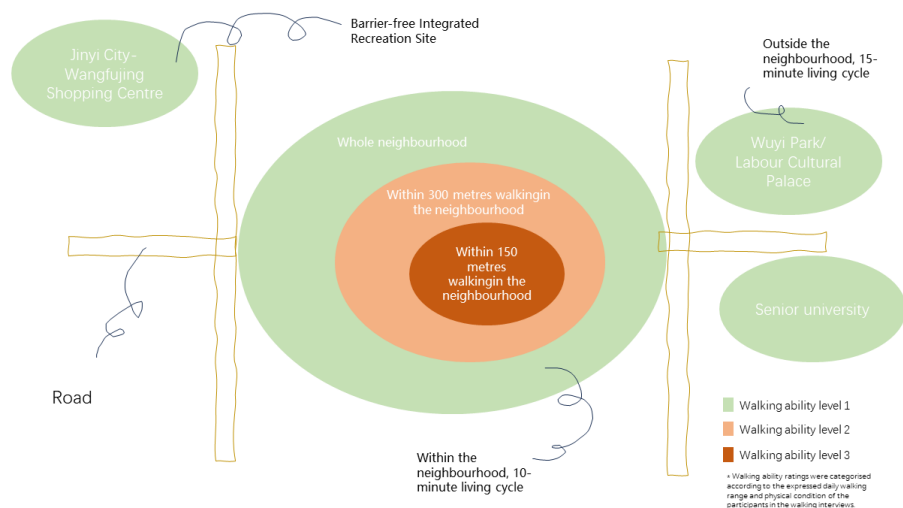


Figure 6. Staying area for participants with different physical conditions

In addition, older people are actively creating spaces for social gatherings (Figure 7). These resident-built spaces can be seen throughout the community. These open spaces are constructed with materials contributed by social group members.



Figure 7. Spaces created by social groups

Although these spaces are public, people will default to the ownership belonging to the people who built them. While these ubiquitous resting places are not marked or arranged to prevent strangers from using them, the different social groups in which the participants are embedded only gather in the spaces they have constructed. Furthermore, no participant mentioned using spaces built by others. However, provided there were no significant fire safety hazards overall, the community's management opted to leave it if the space did not have fire hazards. This allowed participants to create their own spaces, thereby make up the lack of public space for older people in high-density communities.

Way of daily traveling

This sub-theme focuses on how older people navigate their daily routines and the extent to which they travel. The compact layout of the community dictates that older people spend most of their time walking—shopping, entertainment, healthcare, and dining within the community. Additionally, the participant's expectations for staying fit and healthy make walking a very efficient way to combine exercise, shopping, personal matters and informal contact with acquaintances. Public transport is the second most popular mode for participants. The city's senior welfare policy offers free off-peak metro rides and all-day bus fares for those over 60, which is the main reason for using it, and ninety per cent

of participants use it for more extended travel. E-tricycles are a pretty popular choice among the people in the community. Nevertheless, due to traffic regulations, e-tricycles can only drive nearby. Most of the time, their movement area was limited to a 15-minute walk.

Adaptive housing

This sub-theme focuses on the need for housing replacement. Lacking lift in the residential building, participants worry about travel problems as they age. Those on the upper floors wish to move to lower-floor flats within the community; however, there is inadequate property information and constraints on the housing budget. Additionally, discrimination against older people by landlords is common when renting.

CONCLUSION

Dynamic management focuses on the immediacy of communication facilitated by the community CPMSC's current model. This immediacy supports flexible regulation and encourages dialogue with older people. The flexibility of management compensates for welfare implementation delay. Secondly, the grid management system assists older residents with fundamental aging-related issues but does not significantly improve the quality of life for the young-old. However, it forms an effective information network, fostering trust in community management.

The theme Cost shows the current layout of the community, which determines that public space capacity cannot increase. Moreover, retirees need help improving their financial problems and rely on their former companies to regulate their pensions. Older people are ineligible for re-employment because of the restrictions on working age under the Law. The next stage of developing an ageing-friendly community should focus on the comprehensive upgrading of the existing space recipe, citing the culture of the community and the habits of the older people there.

Group Creativity of theme shows in the family culture within the community. Therefore, developing age-friendly public spaces, welfare, and services should take the whole family as an object rather than only older people to implement community welfare, services, and environmental renovation. Besides, social groups promote sharing the burden of daycare, taking the initiative to go out, and participating in the construction and maintenance of the street space. Therefore, it is crucial to help maintain and develop social groups.

The theme of Spatial Allocation demonstrates the complexity of the living experience of ageing in place in a high-density community. However, high proximity brings noise and odour problems. Nevertheless, older people identified that the high-density layout has become part of the community's character. Further improvement of retailer management regulations and operating standards should be a key concern in the next step of the local government's upgrade environment work plan. Furthermore, the development process is relatively slow because of the high cost of barrier-free environmental improvements. Meanwhile, an urgent need exists to establish a housing replacement system for older people to help them overcome the lack of barrier-free environments.

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SOMETHING SPECIAL?! AN ANALYSIS OF IMAGE CAMPAIGNS, CITY IDENTITIES AND SPECIFIC CHARACTERISTICS OF MEDIUM-SIZED CITIES IN GERMANY

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INTRODUCTION

What makes cities livable also depends on their specific characteristics. We understand this specificity as a negotiation process of historical, political, social and everyday practical circumstances that are inscribed in the identity of the city and staged by its citizens. We see the analysis of the particularities of cities as central to understand the possibilities and limits of administrative, economic and social action.

Here we take a sociological and political science perspective on the significance of the external presentation in form of city images, and local identities as they are shaped and expressed by civil society actors. Our study focuses on mid-sized German cities with populations between 20,000 and 100,000 inhabitants. In contrast to large cities, these cities are often perceived as more homogeneous and uniform (if not interchangeable). To emphasize their uniqueness, mid-sized cities often try to present themselves as a unified whole through highly accentuated labels and image campaigns, which is primarily a top-down attribution made by city officials. At the same time, the smaller size of the cities considered here often leads to a particularly strong identification with the city and region among its residents, which can have a more immediate impact on the organizational structures, the collective identity and citizens' attachment to their places. The bottom-up perception of the specificities of the city by civil society actors can thus serve as a confirming, complementary or divergent perspective. As we will show, this constellation of perspectives can be theoretically linked to the different identity constructions (legal, resistance and project identities) as formulated by Manuel Castells.¹

Based on a review of city websites and image brochures we categorize the labels of all mid-sized cities in Germany and show that only a handful of mid-sized cities present images of themselves that offer useful starting points for social negotiation processes or political fields of action.

We then present three case-studies of small mid-sized cities,² analyze their labels as well as their civil society field and present perspectives on the local identity of selected civil society initiatives gained from qualitative group interviews to answer the question: *What insights can be gained by analyzing the fractures between top-down and bottom-up constructed identities of cities with regard to their particularities?*

Comparing policy- and non-policy-based labels, association landscape and local identity constructions in the three cities allows us to develop a more elaborate and deeper understanding of the particularities of mid-sized cities in Germany.

THEORY – PARTICULARITIES OF CITIES AND CASTELLS DEFINITION OF IDENTITY

Looking at urban identities to reveal the particularities of cities highlights, how individuals and communities view interpret, experience and construct their urban environments and reflecting the qualities that define a city's unique character. In "The Power of Identity," Manuel Castells³ explores how identity is constructed through three forms: legitimizing identity, resistance identity, and project identity. Legitimizing identity is formed by dominant institutions, resistance identity is developed by (marginalized) groups opposing these institutions, and project identity emerges when social actors build a new identity redefining their position in society. Castells work on identity formation and the distinction between different types of identities is particularly relevant when examining the contrasting perspectives on the particularities of cities: it provides a lens for understanding the dynamic interactions between the official city narrative and the grassroots perspectives we focus here, highlighting how they can both conflict and complement each other.

City Images and labels and their expression of Legal Identity

A city's label, claim, or slogan can be seen as an expression of Castells' concept of legitimizing identity, which is constructed by dominant institutions to shape collective identity and promote social cohesion. These slogans are created by or on behalf of city authorities to project a particular image that highlights desirable attributes and values, reinforcing a narrative that aligns with their strategic goals.⁴ For instance, a city that brands itself as 'green' aims to promote a collective identity centered on environmental awareness and sustainability. This legitimizing identity is intended to attract residents, investors, and tourists who resonate with these values, thereby strengthening the city's social and economic environment. By promoting a unified identity, city labels can help align public perception with institutional goals.

Civil society initiatives and their expression as resistance identities

Civil society initiatives that seek to co-design the city, can be seen as an embodiment of Castells' concept of resistance identities, which emerge from marginalized or subordinate groups that challenge or complement dominant institutions. These grassroots movements often emerge in response to perceived injustices or failures in urban planning and governance. For example, community organizations advocating for affordable housing, environmental justice, or public space preservation challenge prevailing power dynamics by asserting alternative visions for their cities or neighborhood's future. Through activism and participatory projects, these initiatives challenge the status quo and seek to reshape urban living in ways that reflect their values and needs. By raising awareness of urban issues and mobilizing residents, these civic groups create a collective identity rooted in shared experiences of empowerment. This process not only addresses specific urban issues but also fosters a sense of community and belonging among participants, contributing to more inclusive and equitable urban landscapes.

LABELS OF MID-SIZED CITIES IN GERMANY

To gain an overview of the labels used by the 629 mid-sized German cities, we first analyzed the official city websites and image brochures available online using a desktop search. Although in marketing there are different terminologies ('taglines', 'slogans', 'claims'),⁵ in the following we will restrict ourselves to the term 'label' and refer to self-descriptions and attributions that are either used directly in the city logo or appear as self-descriptions in headlines in image brochures and on landingpages. As of May 2024, we found such labels for 285 (45%) of the cities in our scope. Since research on the topic of city marketing, slogans, and labels has not yet focused on mid-sized cities, in a second step we only roughly

followed previously proposed category systems and typologies for city branding⁶ and used inductive categorization to identify the types of city labels shown in Table 1.

Location Region Nature	History Culture Personalities	Attr. Claim & UAP	Community & Home	Policy	Well-Being & Vitality	Specific Industry	Architecture	Special Attractions	University
29,8%	23,5%	17,9%	15,1%	14,4%	9,5%	5,3%	4,2%	3,5%	2,8%
85	67	51	43	41	27	15	12	10	8

Table 1. Categorization of Labels of mid-sized Cities in Germany. Row 2 contains the relative frequencies of the coding of labels in the respective category, row 3 the absolute frequencies. Deviations in the totals of 100% or 285 cases due to multiple coding of single labels.

Categories such as Location, Region, Nature (29,8%) and History, Culture, Personalities (23,5%) are the most common, highlighting geographic and cultural heritage. Attractiveness Claims / Unique Advertising Propositions (17,9%) and Community and Home (15,1%) are also significant, showcasing cities’ efforts to appeal to both residents and visitors. Notably, policy labels (14,4%) like “Digital City,” “Family City,” “The Health City” or “Participatory City” are less frequent, indicating that fewer cities highlight governance or political values in their identity. These policy labels emphasize specific governance priorities, such as (digital) innovation, family-friendliness, healthcare, economy or citizen participation, suggesting a strategic focus on policy-driven urban development. For our case studies, a focus on policy-based labels is particularly fruitful: analyzing them in relation to civil society initiatives’ descriptions of a city’s particularities reveals how grassroots perspectives align with or resist official narratives. In this case, policy-based labels provide more context for understanding the dynamic interplay between institutional goals and community-driven identity formation than labels that emphasize static, inherent features like ‘Heart of the Chiemgau’ or ‘The feel-good-Town’.

CASE STUDIES

The selection of the three cities for our case studies includes two cases where there are labels with a clear policy reference: Ahaus calls itself the ‘Digital City’, Schwerte the ‘Participatory City’. Greven (‘continuously vital’) represents a more typical, average case, using a label without a specific policy reference.

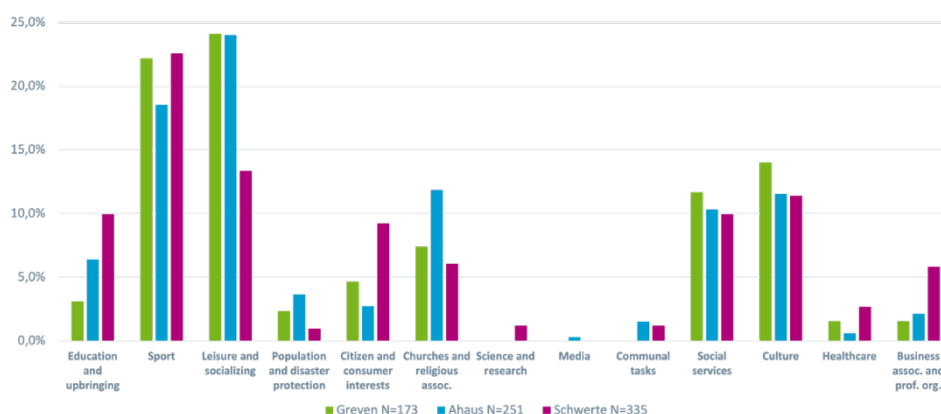


Figure 1. Relative frequencies of occurrence of association types in the mid-sized German cities of Greven, Ahaus and Schwerte

The civil society field of the cities of Ahaus, Greven and Schwerte was analyzed by scraping all associations listed on the cities' websites and dividing their activities into 13 categories taken from the

ZIVIZ Survey 2023 ⁷. This shows that in all cities, involvement in sports, culture, leisure and social services is an important aspect for the city (Figure 1).

It is interesting to note that leisure activities in Ahaus and Greven account for > 20%, where the local culture of carnival and marksmen's clubs are located. In the group interviews with associations from Schwerte, the great engagement for citizen interests becomes clear. This is primarily associated with the former trade union culture and working-class mentality in the mining industry culture.

Ahaus

Ahaus is located in the Münsterland region in western North Rhine-Westphalia near the Netherlands with 40,245 inhabitants.⁸ Ahaus is characterized by agriculture (62.7%)⁹ and as a growing, family-dominated rural city with high incomes and strong purchasing power.¹⁰ Numerous small and medium-sized businesses as well as the software provider Tobit characterize the city's economy. The baroque moated castle is a unique tourist attraction.¹¹

Ahaus labels itself as 'Digital City', stating that digitalization has long been part of everyday life in Ahaus and the key to this is a digital ID provided by Tobit: "practically every one of the 40,000 inhabitants uses it to access the digital services offered by the town, businesses, clubs, organizations and public administration. The extremely high degree of digitalization makes life in Ahaus more lively, communicative, simple, sustainable, colorful and beautiful."¹²

In contrast to that, the group discussion with an association from Ahaus, which has been working since 1977 to safeguard the ecological living conditions in the city shows, that they want to preserve the city as a valuable place. The participants made it clear that they are primarily involved in the initiative to further their goal of creating a better place for future generations and to critically monitor social developments.

The beautiful landscape, the high quality of life and the spatial structure were emphasized in relation to Ahaus. A special mixture of rural character and good connections to larger cities increase the attractiveness. Ahaus is described as a school town with a Christian-conservative milieu and a strong farming community. At the beginning of their involvement, the activists encountered a lot of resistance from this urban milieu. Over the past 10 years the social discourse has become more open, and the city's politicians have begun to support the organization's interests.

This assessment is also supported by the analysis of the civil society field, in which traditional association work in the areas of sport, church, social services and maintaining traditions continue to play a major role. These special features of the city have a major influence on the initiative, as it is mainly young people who leave the city after leaving school to study or spend a year abroad.

The participants in the focus group are somewhat critical of the city's label as a 'digital city'. The digitalization processes would support leisure activities such as gastronomy, shopping and culture to avoid vacancies. At the same time, some are not sure whether the offerings are well protected against possible attacks or power outages.

Greven

Greven is located in the north of North Rhine-Westphalia in the Münsterland region with good connections to the city of Münster and has a population of 38,207.¹³ Like Ahaus, Greven is described as a growing, family-oriented, rural city.¹⁴ The old town is known for its historic buildings, which define the townscape and are considered worthy of protection.¹⁵ The River Ems, which attracts cyclists in particular, is considered to be a unique selling point for tourism.¹⁶ Greven's label 'continuously vital' is used to present the city's strengths in terms of apparent contrasts: descriptions of the "idyllic park and meadow landscape" are complemented by a diverse and widely communicated range of events and the "central, excellently connected location" (including an airport) and many shopping opportunities.¹⁷

The association analyzed in Greven is involved in a city district and tries to shape its development and increase social cohesion. Therefore, it is developing a community center, organizing community events, campaigning for nature conservation and has purchased a van for other associations to use. Through their continuous involvement since 2011, they have built numerous connections with other associations, the press and politicians.

In the group discussion, the participants described their neighborhood as rural with many detached houses in a beautiful landscape. The district is characterized by a strong community and mutual support. The relationship with the Greven city council is ambivalent, as the neighborhood has been neglected in the past. Cooperation with the city administration is also a challenge for the realization of the community center, as it is described as slow and responsibilities are unclear. In the eyes of the initiative, the actions of the city council in particular have a major impact on the image of the city.

Schwerte

Schwerte is located in the center of North Rhine-Westphalia on the border of the Rhine-Ruhr metropolitan region. With 46,658 inhabitants,¹⁸ Schwerte is classified as a moderately ageing and shrinking municipality.¹⁹ The city is characterized by post-industrial transformation processes and the Ruhr River, which runs through the city. A special feature is the large and diverse cultural scene and community engagement landscape. Schwerte labels itself ‘Participatory City’, based on its membership in the federal network ‘engaged city’, the city presents itself as particularly open to feedback and cooperation through an online platform, guidelines for citizen participation, regular social space conferences and a participation office in the city center.²⁰

In Schwerte, two associations that help shape the city were studied. One association has been active since 2002 as a platform for communicating the commitment of another 100 associations, runs a reading mentoring project in an elementary school and organizes an annual citizens' lunch at which between 200 and 400 people discuss their ideas for shaping the city of Schwerte and offers networking opportunities. The other association has been running a public swimming pool for 25 years and offers numerous other cultural activities such as cinema and concerts or a historical play with young people. Thanks to their long-standing commitment, both associations are well networked with the town's politics and administration as well as with other associations.

In the group discussions, the participants described their city as the gateway to the Sauerland region – a low mountain range that is attractive for tourists, and the districts of Villigst and Ergste, which have their own mentalities. One district is more affluent and the other still has a strong “workers” mentality. Due to the proximity to the Ruhr area, many people commute to work in the neighboring cities. This has an impact on the cityscape, as the city center is dominated by people who are not currently in employment.

The city administration's self-image as a “participatory city” also has an impact on the associations' experiences in cooperating with the city administration, and Schwerte was awarded the contract to participate in the “engaged city” alliance funding program because of its existing commitment. One challenge for the associations is the lack of financial resources from the city due to budget cuts, but also the lack of responsibility on the part of individual administrators who not always feel “responsible”.

CONCLUSIONS

The results of the present research show that the special features of the small mid-sized cities studied can be found above all in their socio-spatial orientation, their good social cohesion and the high willingness of urban actors to get involved in civil society. By considering city labels as expressions of legitimizing identities and the perspectives of selected civil society initiatives as expressions of resistance identities, we can show that what makes mid-sized cities special becomes more visible and

tangible when one looks at the negotiation space between top-down and bottom-up identity construction.

The juxtaposition of top-down constructed images and labels with civil society demands for co-designing the city made it clear that policy-based labels can have a strong influence on civil society actors that is intended by officials. Here it is of central importance to establish authenticity in the interactions between city administration and citizens. In Ahaus, while the official narrative focusses on digitalization, the local association interviewed prioritizes environmental sustainability and community preservation. Greven's civic group emphasizes social cohesion in their city-district and criticizes administrative inefficiencies, independent of the city's generic label. In Schwerte, the official label of "Participatory City" is reflected in active civic engagement, which is highlighted by both interviewed associations, although challenges in resource allocation persist.

For further research, it would be interesting to contrast the present findings with surveys or interviews in larger mid-sized cities (>50,000 inhabitants) or cities of other demographic types. Also, a comparison of cities, that try to emphasize similar particularities through their labels and the perspectives of various civic associations. To contrast them would be promising. To promote the quality of life and social cohesion in the city, the present research shows that the negotiation of groups with different interest and perspectives has a positive effect.

It also could be interesting, how historical, topographical, political, economic and socio-demographic factors could have a central impact on the development and potential of mid-sized cities and also to the potential of the civil society initiatives. In any case, whether grassroots perspectives challenge or reinforce official narratives, analyzing their interplay enriches our understanding of how urban identities are constructed and negotiated in medium-sized cities, providing valuable insights into the role of city branding and civic engagement in shaping these identities.

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The authors contributed equally to the success of the article. Therefore, their names are listed in alphabetical order. The research has received funding from the German Research Foundation (DFG) - FOR 5393, Project No. 462287308.

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WHAT IS TO BE DONE? ARTS ROLE IN REBUILDING ASSOCIATIONAL LIFE

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INTRODUCTION

The prolonged adoption of neoliberal economic and political ideologies by recent UK governments has significantly reshaped public life.¹ Embracing free-market capitalism while limiting government intervention, endorsing deregulation, privatization, and reduced public spending has exposed massive inequalities, stifled economic growth, and contributed to a decline in associational life.² Local associations play a crucial role in facilitating participation in civil society.³ A lack of diverse opportunities to develop social associations (waning of civil society organizations, change in working habits and lifestyles, technology, the pandemic, etc.) leads to a decline in political deliberation, this produces atomized citizens and ‘the rise of individualistic forms of participation at the expense of collectivist forms of participation’.⁴

Art projects have established their place in city planning through public installations in placemaking and regeneration contexts.⁵ Artists working within community and social art projects have explored ways to engage with publics, with outcomes not defined by material outputs, but by the interactive processes that occur between the context, local people, and the artist.⁶ Although these strategies integrate art into the social structures of everyday life, critics of neoliberalism argue that the role of art in city development is often used to manage publics and project an image of community cohesion through the involvement of local communities in participatory art projects.⁷ Moreover, the act of contributing to an art project can result in superficial participation, replacing meaningful critique with token involvement.

Within a political framework dedicated to advancing capitalism, artists engaged in social art practice must critically explore ways to address its constraints and limitations. However, when artists are constrained by existing institutional structures and unable to propose new social systems, expecting them to drive innovative change may be unrealistic. Additionally, attributing solutions to artists where others have failed may oversimplify the complexities involved.

DISASSEMBLING AND REASSEMBLING THE SOCIAL WORLD

In *Reassembling the Social*,⁸ Bruno Latour critiques the conventional use of the term "social" by social scientists. He argues that sociologists often treat the social as a pre-existing entity—an established, fixed category that is taken for granted. Instead, Latour proposes that the social is not a given but something that must be actively formed, shaped, and continuously remade. He challenges us to rethink how the social comes into being and he encourages a more dynamic approach to studying it. This leads to his

contribution to, “Actor-network theory”.⁹ “Actor-network theory” asserts that human and non-human actors create everchanging webs of relationships that define situations and determine outcomes, agency is manifest only in the relation of actors to each other. The intention is to acknowledge that society, organizations, ideas, and other key elements are shaped by the interactions between actors in diverse networks rather than having inherent fixed structures or meanings.¹⁰ Rather than being seen as pre-existing, relations within the network are conceptualized as precarious, emerging through network interactions and requiring continual reiteration.¹¹ An assemblage is a technical term for a network, it is the entirety of the actants that make up the thing, or event. Actor-network theory challenges both social and technological determinism by asserting that sociological and technological factors hold equal importance, and no occurrence can be attributed solely to either realm.

Since the 1990s, “Actor-network theory” has been employed as an analytical tool across various fields, including, informatics, health studies, geography, sociology, anthropology, feminist studies, technical communication, and economics.¹² Latour’s work has also impacted upon the field of contemporary art theory and practice;¹³ actor-network theory has shared perspectives with curator Nicholas Bourriaud’s theory of *Relational Aesthetics*.¹⁴ As Francis Halsall describes when making this link, “Relational art”, [Bourriaud] argues, takes as its theoretical horizon, “the realm of human interactions and its social context rather than the assertion of an independent and private symbolic space.”¹⁵ This is a fundamental principle of social art practice today.

TYPES OF INFRASTRUCTURES FOR LIVING TOGETHER

Relational encounters are also central to Rosi Braidotti’s thinking on the “Posthuman”.¹⁶ “irrepressible flows of encounters, interactions, affectivity and desire, which one is not in charge of.”¹⁷ More specifically for Braidotti’s project, is the question of identifying power relationships and utilising various means to enact political and ethical resistance and propose alternative ways of living together. Braidotti asserts ideas of “becoming”, of being open to otherness and not perceiving ourselves as closed, static or fully formed. She goes further than Latour in seeking a positive outcome of the relational networks that she describes: “posthuman ethics urges us to endure the principle of not-One at the in-depth structures of our subjectivity by acknowledging the ties that bind us to the multiple ‘others’ in a vital web of complex interrelations. This ethical principle breaks up the fantasy of unity, totality and one-ness, but also the master narratives of primordial loss, incommensurable lack and irreparable separation.”¹⁸

Braidotti concentrates on empathy as a path to this end. As it, “identifies in emotions, rather than in reason, the key to consciousness.”¹⁹ It is in intimacy achieved through bumpy relationships that Lauren Berlant²⁰ offers as a way towards alternative models of being together. Berlant rejects the idea of togetherness, typically perceived of as central to the commons, and asks if there more to be found in confronting the things that we don’t have mutual empathy for? She suggests that maybe the role of the commons is as a tool for helping us recognise the instants of exchange where we don’t agree: “The better power of the commons is to point to a way to view what’s broken in sociality, the difficulty of convening a world conjointly, although it is inconvenient and hard, and to offer incitements to imagining a liveable provisional life.”²¹

WHAT CAN BE DONE? WORKING WITH ‘THE COMMUNITY’ WHERE THERE IS ‘NOT-ONE’²² COMMUNITY

Latour’s concept of “the social” as never remaining static, Braidotti’s “no one total” view of the world and Berlant’s version of infrastructures, have been a useful way to reflect upon our recent practice.²³

Returning to the contemporary conditions we outlined in the introduction to this paper, we directly address our concerns about the diminishing social provision with places, towns and cities by working

within a community development context. In this section we discuss our ongoing relationship with the community development team in Kings Heath, Northampton, UK. Kings Heath is a housing estate built in the 1950's newmodel community. We first worked in Kings Heath in 2023, in an Arts and Humanities Research Council (AHRC) funded project entitled the Well Communities Research Consortium (WCRC). WCRC was a consortium of local authorities, health bodies and universities, aiming to tackle health inequalities in areas of high deprivation.²⁴



Figure 1. Signage and shopping precinct Park Square, Kings Heath, Northampton UK. June 2023. Photograph by Tim Lloyd

Kings Heath has lost most of its community facilities and resources, with few opportunities for cultural and community events, and was recently designated a Pocket of Deprivation (PoD). The WCRC project set out to build a method for system change with in organisations - removing obstacles to change, hearing about challenges from key workers, learning from the lived experience of residents and identifying the barriers to well-being they face in their area. The emphasis was on asset-based community development work; a methodology for the development of communities based on their strengths and potentials.

Our role as artist researchers was one of developing engagement. We were disillusioned by the way in which artistic research was allocated to the role of technical support, in short applying novel techniques to improve data collection. We made the project *Mapping Kiosk*, a pop-up kiosk consisting of a table and drawing tools with a series of large, redesigned map (60cm x 180cm) of Kings Heath that spread across the surface of the table. The map was a prop to talk through the strengths and challenges of neighbourhood resources.



Figure 2. Partisan Social Club, image of discussion map design for Mapping Kiosk events to be printed at 180 cm x 60cm. May 2023.

As we spoke to residents, we were able to highlight where people lived and what they did in Kings Heath, what facilities they used and how they travelled to school and work etc. We had problems trying to find places to meet with people, as there is no public facing space, no library, no community centre in Kings Heath.



Figure 3. Mapping Kiosk event with participants and researchers. Community room, Kings Heath Primary Academy. June 2023. Photograph by Partisan Social Club

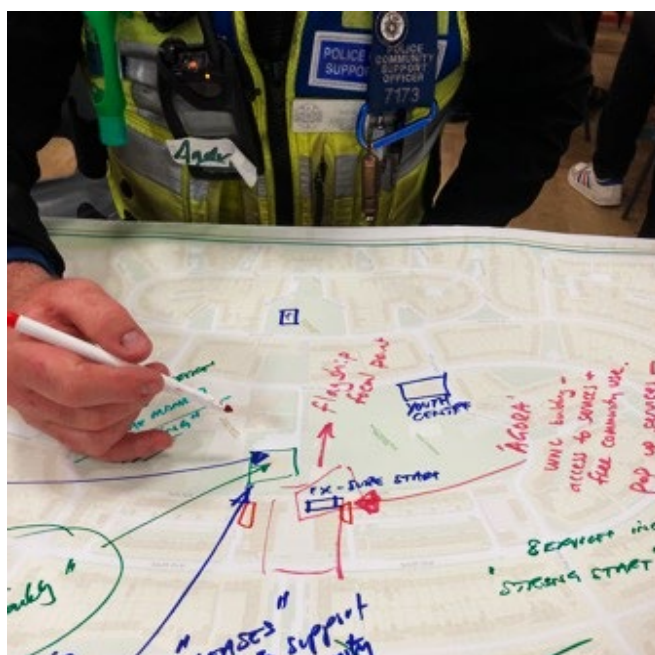


Figure 4. Mapping Kiosk in use with participants at the WCRC World Café, Duston Library, Northampton. June 2023. Photograph by Partisan Social Club.

We had to use a range of borrowed spaces, (including the precinct) to meet our residents in.²⁵ One of the most significant insights was confronting the tangible challenge of finding a space to gather and have meaningful conversations. This revealed a critical gap: while projects are often designed around the assumption of an established community (and the presence of a communal space), this assumption can mask deeper complexities. Such approaches risk perpetuating a “fantasy of unity, totality, and oneness,” overlooking the fragmented realities of community dynamics and the structural barriers to

genuine connection.²⁶ Community development teams struggle with meeting this expectation. Doubts arise, and presumptions about available space become attached to the idea of ‘making’ a community.



Figure 5. Pop up Mapping Kiosk in Park Square, Kings Heath, Northampton. June 2023. Photograph by Partisan Social Club

The confusion about the making and serving of a community could be a glitch in the infrastructure, or a reliance on a predetermined function of the commons. The problem is possibly too difficult to admit, as uncertainty here can unravel one’s sense of being, or the constructed desire for consensus. As Berlant says, “Although the commons claim sounds like an uncontestably positive aim, the concept in this context threatens to cover over the very complexity of social jockeying and interdependence it responds to by delivering a confirming affective surplus in advance of the lifeworld it’s also seeking.”²⁷

UNLEARNING. WILL WE EVER UNLEARN?

The WCRC project did not receive further funding from the AHRC, but relationships were built and commitments established. This year we, Andy Hewitt, Mel Jordan and Michael Wright,²⁸ were invited back, by the Community Safety and Engagement Team, West Northamptonshire Council.

Despite the difficulties of engagement, we were eager to return to see some of the people we had already started to get to know. We devised a zine²⁹ making project under the title *Social Art Club: Kings Heath Calling*. The project developed a “zine kiosk” where residents could produce zines and posters that tell their personal stories of Kings Heath.



Figure 6. Social Art Club: Kings Heath Calling. Zines made by people from Kings Heath. May 2024. Photograph by Partisan Social Club.

We ran into similar issues, lack of space, no resources, poverty, public drug taking, ethics difficult to achieve with no defined group or association, community development team stretched and still feeling redundant. Also, the ongoing questioning of our motives, the strange structural gap between the funding we applied for, the expectations of its articulation, and the reality of the situation.

As the project 'timeline' ended we started to think about the problems – the 'glitches of infrastructures' as something to be embraced. To openly admit the issues arising, and not attempt to articulate this as a success, but to think about it as part of an assemblage of engagement.

CONCLUSIONS BUT ALSO BEGINNINGS

The role of contemporary art in city making whether in placemaking schemes as permanent public art or as part of community engagement initiatives, exists as part of the institution of urban planning. Latour reminds us that "the social" is not a pre-existing entity and that it is continually made and remade. This

aligns with contemporary art processes which play a part in the perpetual nature of cultural and social life. Contemporary art is produced as a response to the world and at the same time, through exhibition and publishing, it effects new understandings of the world. Hence, if arts practice is engaged in the process of remaking the social, then it needs to be recognised as an inherent part of the making and remaking of liveable cities.

Bariotti³⁰ gives us hope through her articulation of the complexities of publics, which are never reduced to a single entity. This allows us to embrace a fragmented understanding of the social. When working in social contexts, it means we shouldn't worry about the complexity of the social makeup of subjects. What we experience is not necessary a failure on our part - for not creating a more innovative or inclusive project - but rather the inherent nature of how the social operates.

By considering Berlant's ideas of the commons as a tool for highlighting the issues that arise from striving for unity, we can potentially identify a practical and adaptable path through the complexities of working with others in social contexts and embrace the "inconvenience of other people": "I am proposing that one task for makers of critical social form is to offer not just judgment about positions and practices in the world, but terms of transition that alter the harder and softer, tighter and looser infrastructures of sociality itself."³¹

We are returning to work in Kings Heath in 2025 (or perhaps we never truly left), but we will be rethinking the role of art in rebuilding associational life. We will engage with the infrastructures we identify through the agency of the people we meet, but not necessarily following a typical grassroots approach. Instead, we will embrace the intimacy and learning that emerges from our awkward encounters with others, accepting the complexities of living and being together rather than seeking a singular sense of community or predefined 'successful outcomes'.

NOTES

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¹³ Bruno Latour curated art exhibitions most notably *Making Things Public: The Atmospheres of Democracy*, with Peter Weibel in 2005, and more recently along with Martin Guinard, he curated the Taipeh Biennale of Art, 2020.

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¹⁶ Rosi Braidotti, "The concept of human has always been associated with relations of power", *Centre de Cultura Contemporània de Barcelona*, 2022, accessed May 5, 2022, https://www.youtube.com/watch?v=mb2_a-UX1OE

¹⁷ Rosi Braidotti, "The concept of human has always been associated with relations of power", 2022

¹⁸ Rosi Braidotti, 2022

¹⁹ Rosi Braidotti, 2022

²⁰ Lauren Berlant, "*On the Inconvenience of Other People*", New York, USA: Duke University Press, 2022.

²¹ Lauren Berlant, "The commons: Infrastructures for troubling times*". *Environment and Planning D: Society and Space*, 34(3), 2016 395. <https://doi.org/10.1177/0263775816645989>

²² Rosi Braidotti, 2022

²³ Our work explores the intersection of art and politics, focusing on the theory of the public sphere and the concept of opinion formation. We create artworks through methods such as agonistic participation and manifesto or slogan making. These artworks aim to envision new ways of living together rather than merely criticizing the current status quo. Our methodology is grounded in contemporary art history, cultural studies, critical theory, and the practical act of acting in and making with the social arrangements we encounter. Through this approach, we aim to discuss the complexity of dissensus within the normative practices of liberal democracy, this aim drives the tactics present in our projects. Our project is called the "Partisan Social Club". <http://partisansocialclub.com>.

²⁴ The WCRC consortium consisted of City University London, Royal College of Music, University College London, University of Northampton, Voluntary Impact Northampton, Tower Hamlets CVS, North East London Integrated Care Board, Northampton Integrated Care Board, Office for Health Improvement and Disparities.

²⁵ Kings Heath primary academy has a community space inside the building and although this makes sense for parents with school age children, it is limited in providing the open access we needed to reach a broad range of people.

²⁶ Rosi Braidotti, 2022

²⁷ Lauren Berlant, "The commons: Infrastructures for troubling times*". 397

²⁸ We raised some engagement funding from the University of Northampton (Hewitt) for project costs and Coventry University (Jordan) and Middlesex University (Wright) allowed research time for us to pursue the project. Dr. Polly Jarman, was a research assistant on the project.

²⁹ A zine is a small-circulation self-published work of original or appropriated texts and images, usually reproduced via a copy machine. We utilise zine making as a process to enable agonistic exchange. To make a zine you must understand what you believe in and what you stand for. When creating a zine you reflect upon your values, opinions and expectations.

³⁰ Rosi Braidotti, 2022

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EXAMINING THE LINK BETWEEN STRESS AND THE BUILT ENVIRONMENT IN URBAN EMERGENCY DEPARTMENT WAITING ROOMS

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INTRODUCTION

This 2023 two-part study was conducted to determine how factors in the built environment influence patient and caregiver stress in an urban emergency department (ED) waiting area. During phase one, 106 participants were surveyed to provide demographic information, anxiety levels, and perspectives concerning environmental domains. Across all users, results showed that there was a moderate correlation between total state anxiety scores and mean domain scores. Furniture layout, privacy, and sounds were noted as the most unpleasant qualities. During phase two, three virtual reality schemes of potential renovations to the area were constructed using the data from the prior investigation. Twenty-four staff members and community members completed surveys and provided qualitative feedback to reveal that staff balanced function and comfort when asked about environmental goals, while potential patients were concerned primarily with comfort, convenience and stress reduction. Although functional needs must be met, we further recommend minimally invasive modifications to address patient priorities. These include improving lighting, privacy, sounds, and visual stimuli (adding restful colors, natural elements, and artwork) in urban ED waiting areas, all of which are known to have stress reducing qualities.

BACKGROUND

Healthcare settings can be areas of high stress, and waiting rooms especially can be triggering locations. In a 2016 survey, 63% of participants reported that the most stressful part of their healthcare appointment was waiting to be seen.¹ In emergency departments this is particularly true, where the median time patients spend on their overall visit nationwide is almost three hours.² A significant percentage of that time is spent in the waiting area of the emergency department.

One of the main causes of stress and frustration in waiting rooms is an indeterminate length of waiting, which research shows feels considerably longer to those involved than a finite wait.³ It has also been found that many users in waiting rooms express that they feel powerless and have no control.⁴ Given this baseline, any added distress from the environment can be seen as intolerable.

Stress in the ED waiting room is not only concerning for these reasons, but also dangerous. In a 2022 survey by American College of Emergency Physicians, 55% of doctors and 70% of nurses reported that they had been physically assaulted, primarily by patients, most often caused by overcrowding and a

wait time they deemed too lengthy.⁵ Therefore, waiting room design has important implications for the well-being and safety of users and ED staff.

OBJECTIVES

The goals of this study were to 1) determine how the built environment contributes to stress in an emergency department waiting area and 2) to define informed recommendations for increasing wellness and decreasing environmental stress in these waiting areas.

Although there are many studies that focus on specific aspects of the built environment in urban emergency departments, we wanted to gain a broader understanding of the holistic factors in the space that can impact stress.

Emergency Care in the United States

In the United States, an emergency department is recommended for true emergencies only – such as head and cardiac-related issues and various fractures of the body.⁶ There are alternate forms of care for less severe needs, known as urgent care clinics, but patients are not always clear on the distinction and often visit EDs for non-emergencies, increasing burden on already taxed facilities.⁷ More patients mean longer wait times – especially for those without life-threatening issues.

Study Location and Context

The hospital utilized for this research study was an urban academic teaching hospital in Philadelphia, the sixth largest city in the United States. Between June 2023 and June 2024, this emergency department treated over 72,000 patients.

Due to the closure of another local hospital, this ED manages an especially high number of admissions from gunshot wounds, serious assaults and high-speed collisions from the local highways. In addition, although exact numbers are unknown, many unhoused people also utilize the facility, posing a unique set of needs and challenges for this setting.



Figure 1. View from front of emergency department waiting area. Image by study investigators.

METHODS

Our study consisted of in-person observations of the ED waiting area, surveys of patients, staff, and caregivers, and virtual reality immersions involving design simulations. In each phase of the study, participants were compensated via gift cards.

Phase One

In this phase, the investigators took four-hour shifts in the ED waiting room over the course of two months. Data was collected from a diverse sample of users (see Table), including seventy-three patients and thirty-three caregivers. The only inclusion criteria were age eighteen or older, and being a patient or caregiver.

Variable	Statistic	Variable	Statistic
Age in years, M (SD), range	45.5 (17.3), 19-80	Race/ethnicity, n (%)	
Role, n (%)		American Indian or Alaska Native	1 (0.9%)
Patient	73, 68.9%	Asian	4 (3.8%)
Caregiver/guest of patient	33, 31.1%	Black or African American	53 (50.0%)
Gender, n (%)		Hispanic, Latino, or Spanish origin	5 (4.7%)
Women	75, 59.5%	White or Caucasian	40 (37.7%)
Men	47, 37.3%	Other race	2 (1.9%)
Non-binary people	2, 1.6%	Prefer not to say	1 (0.9%)
Prefer not to say	2, 1.6%		

Figure 2. Diversity of Data Set

We approached potential participants several minutes after check-in so they could acclimate to the space. After providing informed consent, each participant completed a survey, either electronically or as a printed version. The survey included demographic items and the state version of the State-Trait Anxiety Inventory (STAI-S).⁸ which we used as an index of stress in the moment. For patients, we also assessed current pain using the Numerical Pain Rating Scale.⁹

The survey also included an inventory, which asked them to rate a variety of environmental domains on a 1-5 Likert scale (where “1” was “extremely pleasant” and “5” was “extremely unpleasant”). These domains represented various sensory, physical, and functional aspects of the space, such as lighting, views, sounds, smells, etc.

For both patients and caregivers, Pearson correlations between STAI total scores and mean score on the environmental domain inventory were calculated. For patients, partial correlations between STAI scores and environmental domain scores were calculated while controlling for current pain rating.

Phase Two

Based on the results of the State-Trait Anxiety Inventory, the environmental domain inventory, and qualitative feedback from staff, three design schemes of potential renovations to the ED waiting area were created.

During this phase, eligible participants were emergency department staff or members of the local community who had visited an ED in the past, aged eighteen years or older. They were approached via email utilizing an employee distribution list and through in-person recruitment within the community. Once consented, staff provided feedback on the existing state of the waiting room, using the environmental domain inventory from Phase One. Participants viewed the three design schemes using virtual reality headsets or walkthroughs. Participants in VR could either stand and move around to

explore the spaces or be seated for comfort. If any cyber sickness occurred, participants could take breaks or opt to participate in the walkthrough instead.

The order in which the participants viewed the schemes varied to minimize order effects. Once participants completed the virtual portion of phase two, they were asked to rank the three schemes in order of preference, for each environmental domain.



Figure 3. Schemes of potential renovations: Mountain (top left), Nature (top right) and Blue (bottom)

RESULTS

Phase One

Consistent with previous studies in medical waiting rooms, our results indicated elevated stress among ED visitors (STAI total scores: $M = 45.62$, $SD = 12.23$). There were no differences in the state anxiety levels reported by patients compared to caregivers. There was however, a moderate correlation between more unpleasant ratings of the environment and higher state anxiety, $r(105) = 0.46$, $p < .001$. For patients, the association between more unpleasant ratings of the environment and higher state anxiety remained when controlling for current pain, $r(88) = 0.41$, $p < .001$.

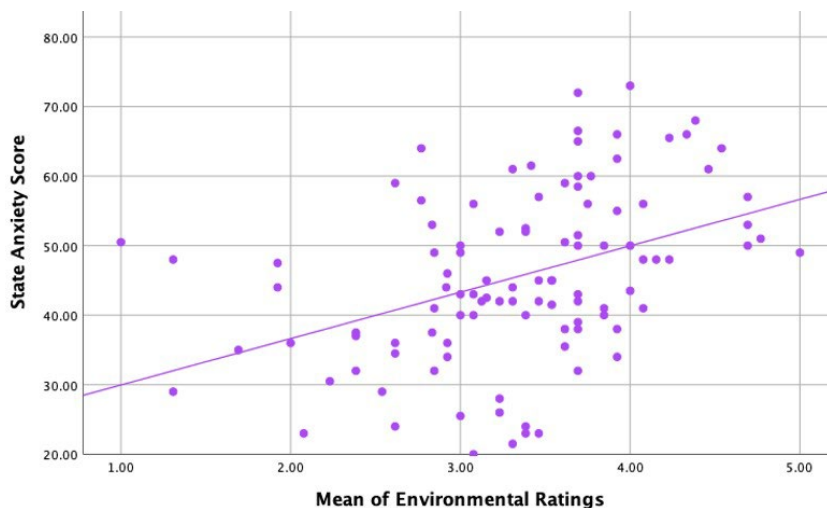


Figure 4. Positive correlation between users’ anxiety in the current moment and perceived unpleasantness of the space

Overall, mean environmental domain ratings were on the unpleasant end of the spectrum and there were no differences in the ratings provided by patients versus caregivers. The vast majority of domains were rated as higher than a 3 on a 5-point scale, where 1 was most pleasant and 5 was most unpleasant. In order of most unpleasant, these poorly rated domains were sounds in the room, perceived privacy, furniture comfort, views outside the windows, furniture layout, views within the room, natural light, smells in the room, and colors in the room (Refer to Table). Patients and caregivers rated two environmental domains as nearly neutral: temperature and artificial lighting. One domain, ease of finding and using necessary signage, was rated as slightly pleasant.

Domain	Mean	SD	Domain	Mean	SD
Sounds in the room	3.71	1.03	Ease of finding & using necessary signage	2.84	1.14
Temperature of the room	3.03	0.92	Ease of movement through area for users	3.40	1.25
Views within the room	3.40	1.10	Colors in the room	3.16	1.04
View outside the windows	3.54	1.04	Furniture comfort	3.55	1.15
Natural light	3.37	1.12	Furniture layout	3.42	1.14
Artificial light	3.03	0.99	Perceived privacy	3.60	1.30
Smells in the room	3.37	1.01			

Figure 5. Mean user ratings for each environmental domain on a 1-5 Likert Scale, where 1 is most pleasant and 5 is most unpleasant

Our sample size did not permit a comprehensive analysis of demographic differences in the data; however, we did identify a few differences between men and women. Compared to men, women rated views inside the space, smells, and furniture arrangement as more unpleasant. When collapsing across domains, overall mean environmental ratings did not differ between men and women.

Phase Two

Seven ED staff members provided ratings of the current waiting area. Given the small sample size, we could not make official comparisons between the staff and patients and caregivers. However, descriptively, the staff rated the current ED space even more poorly than the users did in Phase One. Across domains, the mean staff rating was 4.15 ($SD = 0.50$), with all domains scoring on the unpleasant end of the spectrum. Privacy and smells in the room were given the worst possible rating (5) by all of the staff members.

Staff and community members explored and ranked three virtual schemes with proposed renovations for the ED waiting area: Mountain, Nature and Blue. In most cases, staff and community members agreed on their preferences. Both groups preferred the Blue scheme for the following attributes: colors, signage, privacy, and check-in location. Mountain was ranked highest for its interior views, and Nature was ranked highest for ease of movement throughout the space.

Staff and community members differed in their favorite schemes on two attributes: furniture design and furniture arrangement. Community members preferred the furniture design in the Nature scheme, while staff preferred the Mountain scheme. For furniture arrangement, community members preferred Nature, while staff preferred the Blue scheme.

This difference in preference was clarified in qualitative data collected during the virtual immersions. Patients expressed wanting seating that would be comfortable over long periods of time and seating arrangements that would allow them to sit with caregivers and in a manner that would provide some degree of privacy. Staff, on the other hand, wanted furniture that was easy to clean and that would dissuade people from laying down. The staff was also focused on dense seating to accommodate large numbers of patients and guests; they preferred that this seating be bolted down, so that guests could not move furniture or block pathways.



Figure 6. Blue design scheme showing proposed movable chairs near desks

DISCUSSION

The results revealed environmental concerns that are relevant to urban emergency department waiting areas across the United States. Some of these are a result of outdated designs, but many reflect functional choices that may not be obvious to a one-time visitor to the space. For example, the natural lighting in the waiting area we observed is limited, with just a small amount of light filtering in through a glass block wall. Although the lack of views may be frustrating to those within, transparent glass would be a challenge in an urban area due to safety and privacy concerns (e.g., passersby on the street looking in). Additionally, in many urban healthcare settings, security systems have been added. When not part of the original design, these are often in less than ideal locations. In our case study, the metal detector limited seating availability and added a jarring buzzing sound whenever someone entered the space. Several guests commented on its disruptive effect, with one writing, “The metal detector kept alarming and when you are waiting for news about your family members inside the emergency room, it added stress and anxiety.”



Figure 7. Security area in emergency department waiting area. Image by study investigators.

The furniture design in our space scored low as well, partly due to lack of cushioning on the chairs. However, there are several reasons for non-upholstered seating in urban EDs. Bodily fluids are frequent so the furniture needs to be easily cleanable and sanitizable. There is also a high threat of parasite infestation; Philadelphia is rated the third highest city in the United States for bed bug incidents.¹⁰ Only hard surfaces are immune to bed bugs, unfortunately, but is likely that those sitting for hours are not considering that those uncomfortable surfaces are in their best interest.

In another example, several participants noted a lack of privacy as a source of discomfort, due to both the close proximity of the linked seats and the lack of walls around intake locations, such as the registration desk and the vitals station. Private questions, including a screening for potential mental health crisis, are asked in this area and are easily overheard by those seated nearby. Similarly, doctors often come out to the waiting area to discuss next steps with patients, a change which was made to decrease overcrowding in the back and wait time in the ED overall, but these conversations can also be easily overheard in the open waiting area.

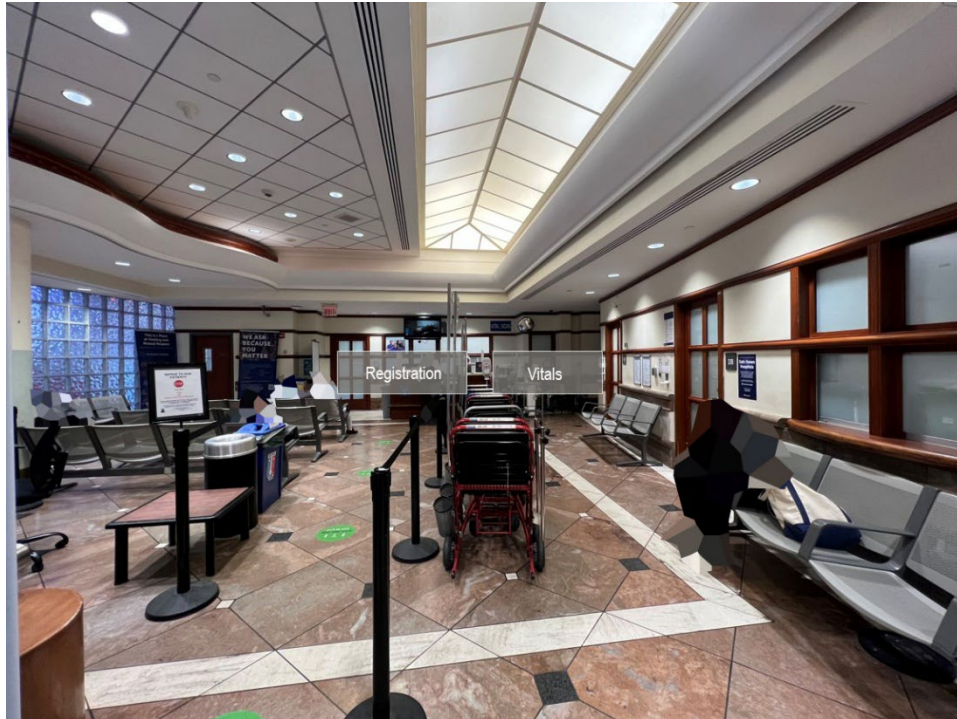


Figure 8. Potential privacy challenges posed by open floor plan. Image by study investigators.

While these results from phase one highlight existing issues inherent in EDs, results from phase two offered insight into opportunities for improvement. Although staff balanced function and comfort when asked about environmental goals and potential patients were concerned primarily with comfort, convenience and stress reduction, there were many areas of agreement for proposed improvements. These areas included: the addition of plants, murals with a nature theme, colors that were calming, better privacy, moving registration to the front, and more accessibility and ease of movement through the space. Identifying these shared goals can guide renovations that positively impact all stakeholders. Literature provides many additional suggestions for modifications as well.



Figure 9. Proposed design schemes

IMPLICATIONS FOR PRACTICE

Stress in the waiting room may not be completely preventable with so much of the design needing to prioritize function, but many of the environmental domains we tested can be improved with careful planning as follows:

Incorporate Nature

The well-established biophilia framework asserts that people instinctually have an affinity for the natural world,¹¹ and experience a reduction in stress when exposed to natural elements. Views of outdoor nature spaces are ideal, but given the challenges of urban settings, namely limited greenspaces and/or privacy concerns, this is not always an option.¹² In these situations, there are still ways to incorporate biophilic elements. One strategy involves the use of plants, even artificial plants, which can decrease stress and anxiety.¹³ If artwork is going to be included, nature scenes should be prioritized. Also, the waiting area can be improved by featuring materials with textures like wood and stone, and by including fire and water elements. Studies with biometrics have demonstrated that incorporating these natural elements reduces blood pressure, stress hormones, pulse rate, muscle tension, and self-reported stress.¹⁴ Given that highly textural surfaces may be difficult to utilize in an environment where cleanability is a priority, these surfaces should be used in low touch areas or out of reach of visitors. Fire and water elements can be added through artificial fireplaces, and water walls, fountains, or aquariums. Aquariums in urban locations, however, should be held behind walls to minimize safety concerns.¹⁵

Thoughtful Color Choices

Colors should be carefully considered in stressful healthcare settings. Too much color can be over stimulating but too little color can lead to an institutional-like setting. Cooler colors like greens and blues are a good choice as they can decrease the pulse rate¹⁶ and one shade of pink was found to relieve tension.¹⁷ Conversely, the color white has been noted as causing glare linked to eyestrain and headaches so it should be avoided in settings with fluorescent lighting where visitors are already medically compromised.¹⁸

Opportunities for Diversion

Opportunities for visitors to use their time in a way that feels constructive can be helpful. This might include socialization, reading magazines,¹⁹ or listening to music. Music played in individual headsets was shown to reduce anxiety and respiratory rates of patients in waiting rooms.²⁰ “Also, patients who were played live music using guitar, flute, and voice showed lowered levels of stress,”²¹ while hearing classical music also showed a decrease in anxiety levels.²²

Other

In general, if space allows, providing options in the ED waiting area is ideal. In our study, some patients who appeared very ill covered their heads to shut out the light and nearby conversations. Zones that provide choices for dark or light, quiet or conversations would be best to provide the least stress inducing environment. Additionally, small adaptations that can be provided are encouraged—such as blankets for those who need them, cushions to raise injured limbs, etc.

Finally, we recommend comfortable temperatures, neutral smells, intuitive wayfinding, recharging stations for electronic devices, easy movement, and furniture that is at least varied to accommodate all weights and heights. Privacy should be considered when deciding on the placement of elements where information is collected (e.g., registration, vitals, consultations).

Suggested Ongoing Assessment

How do we know if changes to the space have had the desired results? We suggest that healthcare systems consider the built environment in ongoing post-visit surveys. If one or two questions are included routinely then when any changes are made, it is easy to track whether these have made an impact on the user experience. These might include if the waiting room space was comfortable or if it

met the user's needs during their visit. By continuously monitoring how the waiting room environment is affecting users, progress can be made to improve stress levels and create a more pleasant healthcare experience for all stakeholders.

CONCLUSION

Although functional needs should be a priority in the design of emergency department waiting areas, many aspects of these practical decisions add stress to the patients and caregivers of the spaces. Given the length of time users often wait and their physical and mental states of unwellness, just about any small negative environmental issue can feel more significant. For this reason, the physical space in ED waiting rooms must be especially considered to reduce the stress of patients, caregivers, and consequently staff members.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Thomas Jefferson University's Institutional Review Board: IRB # IRISID-2022-0906 in 2023.

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PLACES FOR PLAY – A DANISH CASE

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INTRODUCTION

Play is recognized as an important part of childhood and is a key factor in physical development, as well as mental health, well-being and resilience. However, good conditions for play are under pressure, due to a variety of reasons, such as long school days that limits time for free play and concerns about safety which limits the number of spaces children and young people are allowed be on their own. As a result, the playgrounds at day care facilities and at school have become the main spaces for (outdoor) play in everyday life for a lot of children. This paper investigates the playgrounds in a mid-sized Danish province town. The paper presents the results of the analysis of two school playgrounds; one urban school and one suburban school, which serve as examples of the places for play available now. The two schools are situated in the inner-city school and in a suburb. The proposes a methodology for the analysis, which combine three approaches, each chosen as responses to the three main questions: where does play happen, what do the children play and what do they play with? The investigation of the play spaces is based on Jan Gehls 12 quality criteria for assessing urban spaces.¹ The mapping of the occurring play types is based on the play typologies developed by Bob Hughes² and Roger Caillois³ and the mapping of the objects and equipment that is played with onsite, is based on on the concept of “*Playthings*” by Miguel Sicart.⁴

The paper traces the current state of “places for play” in this Danish context, where most playgrounds consist of similar equipment (a sand box, swings, slides, climbing towers and *MUGAs*), and points to opportunities and obstacles for improvement of these places.

The main contribution of the presentation is a proposal for a methodology for playground analysis, which can be applied to any kind of play space.

Background

The point of departure of the paper is the paradoxical situation that play is a recognized as a fundamental trait of being human and categorized as a human right by the UNCRC article 31,⁵ while research is documenting a current play crisis.⁶

Play is important for all forms of child development; both in in terms of physical development: getting to know your body and its limitation, learning new skills, improving motor skills etc. and in terms of mental resilience: building and understanding social relations, making friends, developing social strategies etc. is trained during play.⁷

The Danish research project *Playresearch 2023* (author’s translation) show that the children in the project play less than just a few years back.⁸ There are multiple and diverse reasons for this, such as long school day, the popularity of screen-based activities, tight schedules in most families etc. As a

result, children play more on digital platforms than physically, and the amount of outdoor play is decreasing. Play today is different than what the parent generation know from their childhood: playing with neighbors and in in the neighborhood is almost non-existent, as children rarely play with friends at home, but play with their family instead. That also means that there is a lot of adult supervision associated with play today.

Is the play crisis also a play space crisis?

The underlying question for this paper is if the crisis in play has connections to the quality of the spaces of play; if less time for play also is connected to less places for play and if the crisis in play is visible in terms of quality of the places of play?

This paper focuses on the places for play, that are on offer during school days. What characterizes the school playgrounds of Danish schools, and do they provide good conditions for the play experiences, that are important for child development?

PLAYGROUND ANALYSIS

The methodology for analyzing the school playgrounds is a composition of three approaches, focusing on three different aspects of the playground: 1. Space: Where are the children playing? 2. Playthings: What do they play with? And 3. Play types: What do they play? These three questions address both the human and non-human factors on the playground to describe the places for play at school.

Space

The spatial aspects of the playgrounds, is based on urban architect Jan Gehls “12 Quality Criteria”.⁹ The 12 criteria are developed for quick assessment of urban spaces and are organized in three main themes: *Protection*, *Comfort* and *Enjoyment*. The investigation of the 12 quality criteria is based on observation and intends to give an overview of the defining features of a space. The 12 criteria are a qualitative approach, that focus on the experiences and possibilities the space provides to the users. Even if the 12 quality criteria are developed for analysis of urban spaces, the approach also adapts to the play spaces. The placement of playgrounds in the immediate surroundings of the schools is very much a question of “life between buildings”, another key concept from Gehls work.¹⁰

Playthings

In the text ‘Thinking the Things We Play With’, games researcher Miguel Sicart proposes an analytical interest in “*Playthings*”, to understand both the material practices of play as well as the relational practices between human and non-human actors in play.¹¹ Sicart considers playthings “*technologies of play*” and argues, that focusing on playthings shifts the focus from solely on the human activity, to a “*relational practice of being in the world, characterized by the creation, recreation, and appropriation of relations between agents and things and mediated by materialities*”.¹² Introducing the concept of Playthings to the analysis of playgrounds, means directing attention to any type of equipment or loose parts; toys or found objects like stones or sticks, that turn into playthings in a relational exchange with the child.¹³ This is new materialist understanding of the activity of play, which understands play as something that emerges in an interplay between humans and playthings.¹⁴ In this context, a Plaything approach, recognizes that the children on the playground hold the agency to negotiate the use and transform the playground to venues for playing, beyond what the designed fixtures provide. Any small space: under a tree, behind a shed can serve as a house, a birds nest, an underground cave etc. and sticks easily become swords, wands, bridges etc.

Play types

The last analytical approach takes its departure in a human-centric viewpoint, that understands play as a human activity. Roger Caillois¹⁵ and Bob Hughes¹⁶ present frameworks for identifying and categorizing different play types. Caillois' operate with four major types of play, while Hughes' framework is more nuanced and lists 16 play types. A mapping of the variety of the play types on-site, give insight into the play that occur, both because of the design of the architecture and equipment available, but also beyond the designed and pre-programmed areas.

The three approaches have been utilized for a survey of playgrounds based on observation and resulting in mappings, that summarizes the playgrounds as places for play. More in-depth analysis, that cover each approach in a more detailed manner is needed in the future, but these initial mappings serve as a pilot project, that provide insight into which future research questions will be, and how to formulate a more detailed research design.

Case presentation: School Playgrounds in Aalborg, DK

Two examples of school playgrounds in Aalborg, Denmark, have been selected for this paper: one inner city school: Sønderbroskolen, and one suburban school: Svenstrup Skole. Aalborg is a province city, with a population of approx. 220.000 citizens. When it comes to describing the conditions at school playgrounds in Denmark, the Aalborg examples are representative, as they shares many similarities with most school design in Denmark: they are governed by the same legislation and have similar funding schemes, and most schools have architecture originating in the early decades of the welfare state: the 1940s, 50s and 60s, with a lot of rebuilding or expansions in the following decades. The school playgrounds have public access in the late afternoons, evenings and holidays, so the playgrounds also serve as neighborhood playgrounds.

More than 80% of the children in Aalborg aged 6-10 are participating in after school childcare/clubs, which are located at the school or in near-by facilities.¹⁷ This means that the school playgrounds are the primary play spaces for (outdoor) play during the week, for most young school children in Denmark, in use both during recess and in after school hours.

Example 1: Svenstrup Skole

The main building of Svenstrup Skole is from 1954, but additions or remodeling have taken place five times since then, the lasts additions in 2005. The asymmetrical plan and composite layout of the school give all pupils easy access to the outdoor areas and provides several smaller spaces between the buildings, suited for many types of play, which provide a sense of security and diversity in materials. The smaller spaces make zones for different age groups possible and dividing the playground into themed zones (Figure 1). Areas with trees and bushes, especially around the edges of the playground serve as areas like "nature playgrounds", while other areas are designated to activities like ball games and climbing (Figure 2).

The playground at Svenstrup Skole has many facilities for ball games ball, such as football, and basketball, which can be played on various surfaces like asphalt/rubber/fake/real grass, as well as outdoor ping pong. The playground also has a lot of standardized play equipment from well-known brands. Especially play equipment that encourages active play like swigs, sea saws, slides and climbing activities for young children, and equipment that can be used for parkour-like activities for teenagers. This type of equipment communicates its use very clearly and is almost monofunctional and can be found in most playgrounds. There are only small amounts of loose parts to play with to be found on the playground in Svenstrup. Some toys are available during opening hours (i.e. buckets and shovels for the sand box, skipping ropes and small cars), but most smaller playthings are often brought from home: i.e. balls, bats, scooters. Physical play types dominate the playground in Svenstrup. Caillois' *Ilinx*;

playthings that operate with vertigo and disorientation is central to the playgrounds aimed at the youngest school children, while *Agon*; sport-like games and competition is dominating the areas for the older children. Playtypes like Simulation, role play, creative and construction play, have less or no facilities, and the spaces where these types of play happen, are the green borders around the school. That means that children who prefer these types of play and spaces are relegated to less safe areas with more noise, pollution from traffic and closeness to by-passers.



Figure 1. Svenstrup Skole. Green: Courts for ball games. Light Blue: Sand Pit. Orange: Climbing and parcours. Dark green: Swings. Blue: dirt hill. Pink: Play Houses. Purple: Camp fire.



Figure 2. Examples of playground facilities at Svenstrup Skole. Sand pit for the youngest children, Parcours and Basketball, football court in the background. Photos: Line Marie Bruun Jespersen

Example 2: Sønderbroskolen

The inner city school Sønderbroskolen was built in 1948, and has undergone one major refurbishment in 2000. The main layout of the school follows the original 1948 design: A four story, L-shaped school building, facing a major intersection, with one large playground area at the back of the building. Within the last 15 years, two kindergartens have been built on the original plot and reduced the playground area (Figure 3). The playground at Sønderbroskolen has many of the same facilities as described above: standardized playground equipment for climbing, swinging etc. and a lot of space for ball games. The playground has less trees and bushes for playing and lacks subdivision into smaller spaces (Figure 4). Through the placement of playthings, there is an attempt to create zones for different age groups and activities, and a smaller area is reserved for the after school-activities, which provides smaller scale spaces, with garden-like qualities: grass, flowerbeds etc.



Figure 3. Sønderbroskolen. Green: Courts for ball games. Orange: Climbing and parcours. Dark green: Swings. Blue: Hill, dirt. Yellow+dark orange: Fenced off area with tracks for pedal cars and small spaces with gardening. Dark grey: Skate ramp.

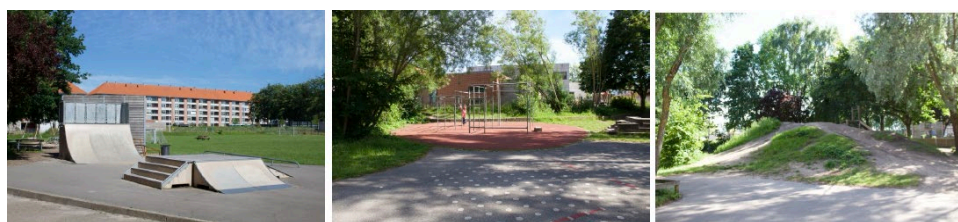


Figure 4. Examples of playground facilities at Sønderbroskolen. Skate ramp, Climbing and dirt hill. Photos: Line Marie Bruun Jespersen

The two examples sum up the main traits of the playgrounds in Aalborg: The areas for play have been reduced over the years, while the number of children and school hours have increased, so the use of the playgrounds has been both densified and intensified. The densification results in a push of the spaces for free play to the edges of the perimeter of the school grounds, which often is close to traffic, noise etc. Intense use means that most surfaces and equipment appear worn and distressed.

The composite school design, where the current school is composed buildings from various periods, have in most cases subdivided the playground area into several smaller spaces, which make zoning into many different activities possible, and lend a sense of quality and safety to the playground. The playthings installed follow a similar pattern in all schools, with only small variation: Use of standardized equipment for swinging, spinning, climbing, etc. is widespread, as the manufacturers guarantee to live up to strict safety regulations. A lot of space is reserved for ball games while there are few facilities that support creative and constructive play, and there are few loose parts to play with. The playgrounds are designed to promote physical play while the children are outdoors, which is not necessarily attractive to all children. It is design for “burning energy”, so the children are ready for calm and orderly activities, when they are indoors.

Reflections on the research design

The three approaches cover both the human and non-human actors of play, which contributes to the understanding of nature of the activities on the playground, as well as the types of activity that rarely or never occur. An operational tool for quick mapping of play types and relations to playthings, comparable to Gehl's 12 Quality Criteria, is needed, to upscale the pilot project to a research project that can assess "places for play" on a national level, and for play analysis in other contexts than playgrounds. In addition, further research into play types and activities involving loose playthings, require observations of longer duration, as the activities are more dynamic and unpredictable, than the activities that are dictated by the fixed equipment's affordances.

Discussion

Despite the critical reflections regarding the methodology and the scale of the case study, these preliminary mappings point to several areas of attention or improvement regarding the school playgrounds. There seems to be both a narrow understanding of play and several structural obstacles behind the uniform state of school playgrounds in Aalborg. The cases show the design of the playgrounds is focused on physical activity and exercise-like games and play types. Since the school playgrounds are in use both during recess and in the afternoon for the six- to ten-year-olds, they are the primary outdoor play space for these children, during weekdays. This should call for high quality spaces, that are not only safe but also accessible and attractive to all kinds of children and their many interests. The focus on physical play makes partly sense if the playgrounds were for recess only, but is too narrow, when afternoons are to be spent in these environments. Opportunities for a broad variety of play types are overlooked, as spaces and design that foregrounds other play types, are almost non-existent, and force children to claim spaces that are unsafe and unattractive; like in the hedges, to find spaces that suit their play preferences. The school management of each school is in charge of their playground, but they lack design knowledge as well as funding to get professional help for making decisions about the playground. There is lack of input from landscape architects, urban designers, professional playworkers or similar, who could be able to combine knowledge of play with the spatial opportunities present at each school. The worn impression of the playgrounds is due to a discrepancy between heavy use and very small budgets for maintenance, which also impacts the availability of loose objects. Loose objects might disappear, or break and they take time to tidy up at the end of the day, so the use of loose objects stresses both staff and budget.

The widespread use of similar play equipment everywhere makes the school playgrounds unattractive and boring: even if the playgrounds should function as neighborhood playgrounds, they are not well used during weekends and holidays. It is understandable that children might want a change in environment outside of schooldays, but in an ideal, livable and child friendly city, the school playgrounds should be so interesting and unique for each school that they would be interesting to play at, even when you as a child were not forced to be there.

NOTES

- ¹ "Twelve Quality Criteria" Gehl – Making Cities for People, accessed August 10, 2024
https://issuu.com/gehlarchitects/docs/twelve-quality-criteria_gehl
- ² Robert Hughes, *A Playworker's Taxonomy of Play Types* (Playlink, 2006)
- ³ Robert Caillois, *Man, Play and Games* (Urbana, Illinois: University of Illinois Press, 2001)
- ⁴ Miguel Sicart, "Thinking the things we play with," in *Material Games Studies. A Philosophy of Analogue Play*, ed. Chloé Germaine et al. (London: Bloomsbury, 2004)
- ⁵ "Convention on the Rights of the Child", General Assembly resolution 44/25, accessed August 10, 2024
<https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-child>
- ⁶ "Learning through Play" The LEGO Foundation, accessed August 10, 2024
<https://learningthroughplay.com/why-play>
- ⁷ Johan Huizinga, *Homo Ludens : A Study of the Play-Element in Culture*. London: Routledge and Kegan Paul, 1949) And "Learning Through Play", The Lego Foundation <https://learningthroughplay.com/why-play/play-boosts-wellbeing-for-lifeand> and "The Playwork Primer". Penny Wilson, Alliance for Childhood. Edition 2010. Accessed August 10, 2024
<https://files.eric.ed.gov/fulltext/ED511455.pdf>
- ⁸ "Legeundersøgelsen 2023", Levende legekultur, accessed August 10, 2024
https://levendelegkultur.dk/wp-content/uploads/2023/11/Legeundersogelse_rapport-final2_141123.pdf
- ⁹ Jan Gehl, *Life between Buildings* (New York: Van Nostrand-Rein, 1987)
- ¹⁰ Jan Gehl, *Life between Buildings* (New York: Van Nostrand-Rein, 1987) and Jan Gehl and Birgitte Svarre. *How to Study Public Life*. Island Press, 2013 and "Twelve Quality Criteria"
- ¹¹ Sicart, *Thinking the things*, 2024
- ¹² Sicart, 2024
- ¹³ Sicart, 2024
- ¹⁴ Sicart, 2024
- ¹⁵ Caillois, *Man, Play and Games*, 2001
- ¹⁶ Hughes, *A Playworkers Taxonomy*, 2006
- ¹⁷ "Børnepasning efter skolestart" Danmarks Statistik, accessed August 10, 2024
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TINY HOUSES AS AN AFFORDABLE HOUSING ALTERNATIVE IN THE CITY: A LITERATURE REVIEW

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INTRODUCTION

High-density cities face widespread challenges in providing affordable housing. Addressing this issue requires avoiding territorial disparities by allocating land use and spatial planning policies that integrate innovative housing models into cohesive urban spaces. Tiny Houses offer a potential solution by promoting fairer urban area distribution and alleviating poverty and social inequalities. However, there is a noticeable gap in the literature regarding micro-housing in urban housing debates. This Study aims to bridge this gap with a systematic review of literature on micro-housing published over the past decade, analysing its relation to city construction and housing access issues. The literature is examined to understand how Tiny Houses can contribute to solving the housing crisis. The Study provides an overview of the global urban housing crisis and links it to the micro-housing debate. Objectives include advancing knowledge on micro-houses, reviewing current literature, and discussing challenges related to urban planning and regulations. The Study aims to lay a foundation for future research and generate new knowledge in the field.

Global Urban Housing Affordability Crisis

Currently, approximately 330 million urban households worldwide are facing homelessness and this number is projected to rise to 440 million by 2025.¹ According to UN estimates, urban areas are home to more than four billion people which show that in 2007 the urban population surpassed the rural population and has continued to grow, as illustrated in *Figure 4*. In underdeveloped countries in Asia and Latin America, it is estimated that between 10% and 50% of urban populations reside in slums. By 2050, it is projected that the urban population will constitute two-thirds of the world's population, according to estimates of future city growth.² The rapid urbanisation and emergence of megacities in recent years has created an intense demand for affordable housing in urban centres.³ Providing affordable housing is a complex issue in densely populated cities, influenced by economic, environmental, and social factors.⁴ The limited supply of land, coupled with high construction material costs and the use of advanced technologies, has resulted in a shortage of affordable housing.⁵ Additionally, financial limitations and access to financing for low-income families are significant barriers to accessing housing in large cities.⁶

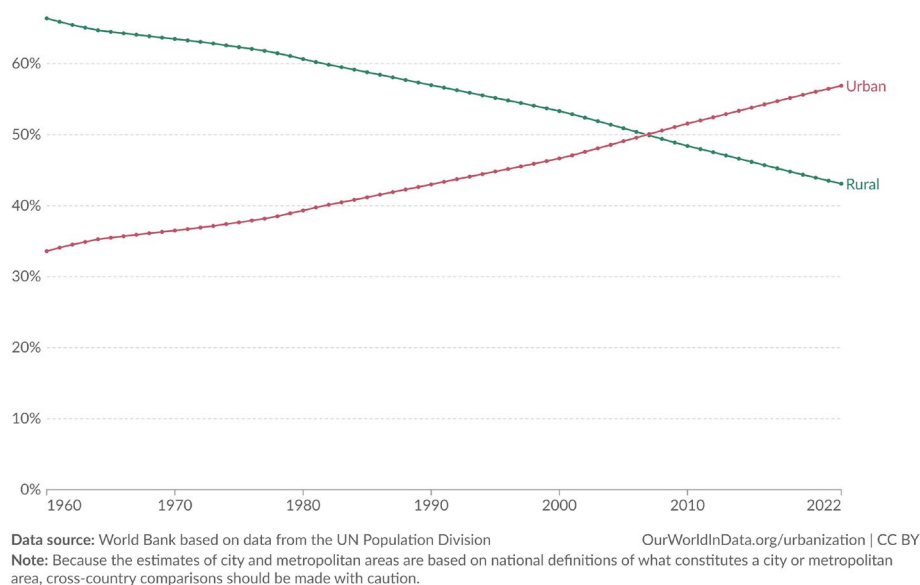


Figure 4. World Population Distribution: 2019 Urban & Rural by Demographia.

The UN-Habitat World Cities Report⁷ considers that the current urbanisation model is unsustainable, as it places several families in social inequality and fosters the proliferation of slums in underdeveloped countries. This model also contributes to disorderly urban expansion, which, although it has been a response to the high cost of housing in urban centres, raises several problems by displacing low-income populations outside the consolidated urban structure.⁸ The emergence of issues related to sustainability,⁹ the environmental impact and the degradation of the environment by urban expansion have raised several urban planning issues.¹⁰ In addition to limiting the access of the displaced population to the public transport network, jobs and services usually located within city centres.¹¹ Within the challenges of providing affordable housing¹² in high-density cities there are opportunities for new approaches to urban planning, infrastructure and technological innovations. However, do not directly solve the problems of access to housing.¹³

The importance of promoting affordable housing in large urban centres lies in their potential for alleviating poverty,¹⁴ reducing overcrowding, and improving the overall quality of life of low-income families. Promoting affordable and sustainable housing units such as Tiny Houses may enhance access to health services, transportation, employment, institutions, and infrastructure in cities. These units offer flexibility and can revitalize urban areas, contributing to city growth and sustainability.¹⁵ However, it is crucial to ensure that their development does not adversely affect the environment, society, or the economy.¹⁶ Although, there are contradictions and complexities in the implementation of affordable housing policies.¹⁷ While there is a consensus on the importance of affordable housing for low-income people in urban centres, the successful implementation of strategies and policies is hampered by economic, administrative, and regulatory challenges.¹⁸ The promotion of affordable housing can be combined with new technologies to reduce housing costs and promote urban planning policies that allow the occupation of empty spaces in cities and allow for more diverse housing, such as micro-housing¹⁹. In this way, it would be possible to prevent the expansion of cities through orderly urban planning that prioritises urban density,²⁰ efficient use of land and avoids wasted areas and real estate speculation within the limits of the city.²¹ In summary, given the growing problems in access to urban housing, a multifaceted approach is necessary. Starting with urban policy reforms as well as innovative housing solutions taking into account the diversity of needs and restrictions of different groups of the population.²²

Methods and Structure

The research was developed through a literature review divided into three stages, presented in *Figure 5*:

- (a) Data Collect (IDENTIFICATION): in a first stage of collecting and selecting articles relevant to the topic;
- (b) Data Select / Filtering (SCREENING): then a prior analysis of the selected texts was carried out in order to filter according to their relevance to the research topic; and
- (c) Data Analyses (INCLUSION): finally, a detailed analysis of the previously selected texts was carried out, with a final filtering carried out to identify whether they met the previously established criteria.

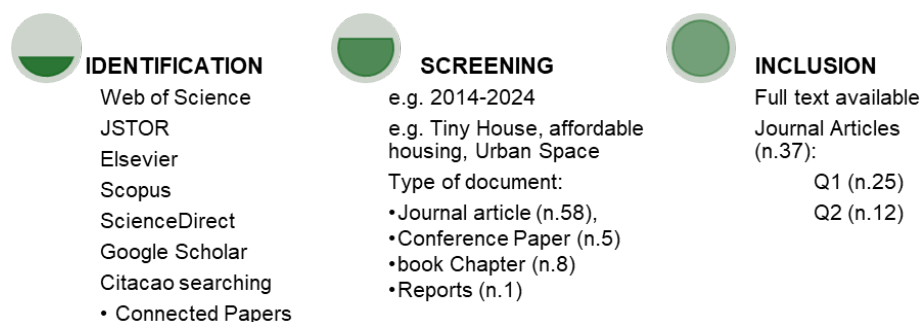


Figure 5. Visual Representation of search and review process

First, in step (a), data collection, a keyword-based search for Conference Papers and Journal Articles was conducted in the scientific databases and Web Scientific Indexing services, Web of Science, Scopus, ScienceDirect, JSTOR and Google Scholar.

The search terms selected for the review were used alone or in combination with each of (1), (2), and (3):

- (1) "Tiny House", "Tiny home", "micro-housing", "small living"
- (2) "Affordable housing", "housing shortage", "housing crises"
- (3) "Urban Space", "urban planning", "land-use policies", "urban housing"

The temporal scope of the search was from 2014 to 2024, which was established for a Tiny House theme. As a sample of the lack of academic data on this subject, a search was performed in JSTOR using the following data:

- Term: "Tiny House"
- Type of content: Journals
- Language: English
- Temporal scope: 2014 – 2024
- 5 Subject: Architecture & Architectural History (32), Sustainability (2), Urban Studies (2)
- 6 Access Type: Content in which I can access

A very small number of documents were found in the JSTOR database (< 36), none of which were relevant or connected to the topic of this research. In the other scientific bases, searches were carried out using similar filters (type, data, language, access type). The data collected from search databases were sometimes much larger than it was possible to analyse, even with additional search terms that could not be analysed. The results were summarised in *Table 3. Overview of the search results* Table 3. Other studies were included in the following stages of article analysis, through a reference network and citation search, on sites such as Connected Papers.

Search Term	Scopus		ScienceDirect		Web of Science		Google Scholar	
	Found	Used	Found	Used	Found	Used	Found	Used
Tiny House	13	6	1145	(**)	95	8	5970	(**)
Tiny OR Micro AND House OR Housing OR Home OR Living *Urban AND Space OR Planning OR Housing)	2	1	155	5	434	(**)	204	>20

Table 3. Overview of the search results

At Stage (b), Data Filtering, I checked whether the collected papers were related to Tiny Houses with affordable housing or to promote tiny housing as an alternative to alleviate housing shortages within urban spaces in big cities. Within this method, a brief analysis was carried out one by one. A reading of summary and keywords to eliminate all the Papers that did not connect with the purposes of this review – see Table 4. I also observed if the collected papers created a link between Tiny House and affordable housing provision within the urban debate. Restricting the search for publication type, the main selection within Conference Papers, Journal Articles and Book Chapters, as well as some relevant information from Government, Institutional reports. For background contextualisation, I also considered online newspapers and blogs. References and citation searches were also analysed to obtain more information in the domain under Study. Subsequently, a library on Zotero was created to have control over the literature, and a datasheet in Excel was filled with the analyses of all documents collected to identify the main key points from the authors’ perspective.

At the Third Stage (c), data analysis, studies that were not possible to access the full text were rejected. As well as texts that were not published in an academic journal with a SCImago Journal Rank (SJR) indicator Q1 or Q2.

Initially, 109 Studies on Tiny Houses were collected at Stage (a), of which 42 Studies were removed from the analysis because they did not meet all the criteria established in Stages (b). A total of 67 texts were included in Stage (c) for analysis and subsequent review of the full article – see Figure 6.

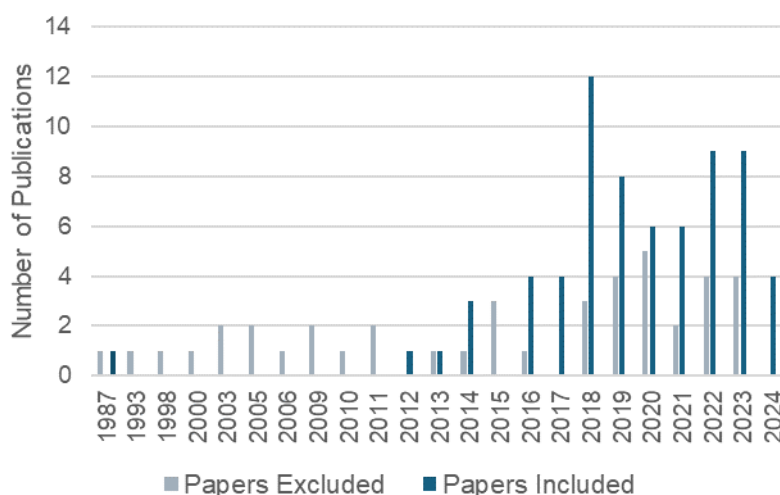


Figure 6. Number of Tiny Houses publications collected by year since 1987

In addition, in the reading and analysis stage of the full articles, a check of the publisher was carried out, and selected the publications made in indexed academic journals and which were classified in the SCImago Journal Rank (SJR) indicator in Quartiles Q1 or Q2.²³

	Included	Excluded
Tiny Houses approach	1. Tiny House as a housing alternative 2. Tiny House as an affordable housing alternative 3. Tiny House as a housing supply solution within the urban housing crisis 4. Tiny House within the context of urban planning / Degrowth agenda / Infill Developments	Studies out of the scope of housing provision, affordability or urban housing
Method of publishing	Academic Literature (Journal Articles and Conference papers) Book Chapters Academic Reports Professional Reports Community websites	Presentations Undergraduate Thesis Master and Ph.D. Thesis Books
Date of Studies	2014 – 2024 (July)	Published before 2014/ after July 2024
Impact Factor Q-Ranking	Q1 – Q2	Without any Q-ranking

Table 4. Criteria for inclusion in or exclusion from the literature review

The next sessions present an overview of the accepted Studies and an analysis of the reviewed studies, in order to understand the point of view presented by the authors in approaching Tiny Houses within the urban context of the housing crisis.

Overview of Studies

The results of Stage (c) were tabulated to identify among the previously selected Studies those that had a Q-ranking indicator Q1 or Q2. At this Stage, 37 studies were selected - see Table 5, 25 studies were published in a Journal with a Q1 classification and 12 studies were published in a Journal with a Q2 classification. The Connected Papers website²⁴ was used to find Studies related to the Study identified above and also to others – see *Figure 7. Graph of papers related to Study of the Ford and Gomez-Lanier, 2017, source: Connected Papers* Figure 7.

Citation Count	Citation Count of Papers without / with SJR index - Quartis: Q1 and Q2										all papers collect - <i>papers accepted</i> - (<i>papers reviewed</i>)		
	Year of Publication										# papers		
	before <2014		from >2014-2024								Tt.	Ac	Rev.
0 (none)	8	-	-	-	22	11	2	2	-	-	32	13	(2)
less than <3	1	-	-	-	8	4	4	4	3	1	16	9	(5)
more than >3	8	2	-	-	20	13	22	19	11	11	61	45	(30)
Total	17	2	0	0	50	28	28	25	14	12	109	67	(37)

Table 5. Papers Collected Overview metrics - Quartiles and Citation Count

The documents selected following Stage (c) were submitted to the Voyant online platform²⁵ to analyse the frequency of terms used in the texts. This analysis was also carried out in the texts used to

contextualise the crisis in urban housing. Voyant analyses the frequency of terms and organises them into word clouds, highlighting the ones with the highest occurrence in size. When comparing both frequency clouds, it is possible to notice that the term Housing appears highlighted in both sets of documents – see Figure 8.

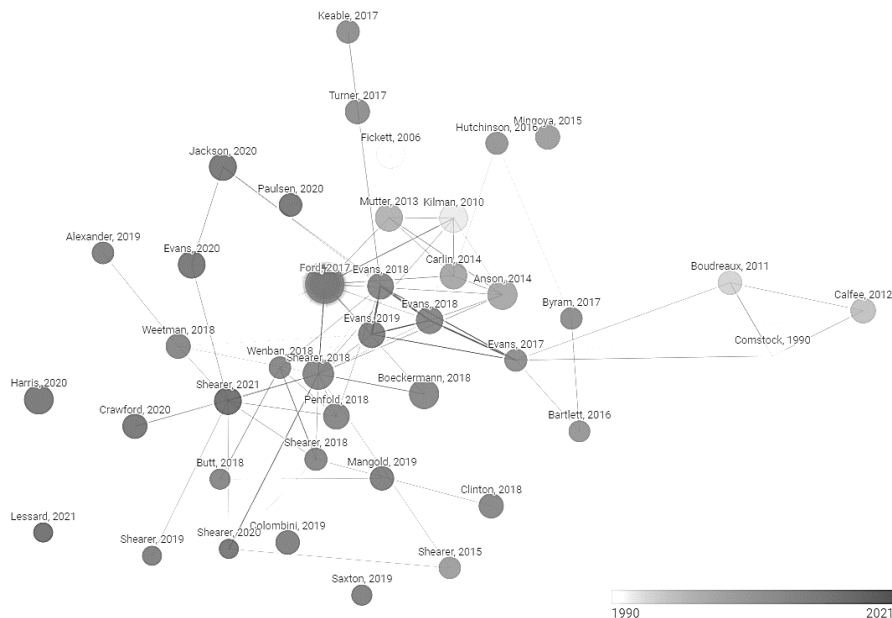


Figure 7. Graph of papers related to Study of the Ford and Gomez-Lanier, 2017, source: Connected Papers

The analysis of the frequency of terms in the texts returned a count of 757 occurrences of the term “Urban” in the Tiny Houses literature and 8927 in the Urban literature. The term “Housing” returned 3041 occurrences in Studies of Tiny Houses versus 4468 in urban literature. When analysing only the literature on Tiny Houses, relevant terms related to the urban context are identified in addition to the term urban itself, such as: planning, land, property, zoning, code, requirement, density, regulations, and also terms in co-occurrence and related to housing, such as: affordable, small, income, cost.

The main methodological approaches identified in the Studies were qualitative, with two Studies using a quantitative approach. Some Studies took a quantitative approach to complement the main qualitative approach. Interviews and qualitative research were carried out in 13 Studies. Among the other Studies, case studies (n.2), observational analyses (n.2), thinking labs (n.1), focus group (n.1) were identified and the remaining Studies had an approach such as literature review, critical review, policy review, empirical and conceptual analyses.



Figure 8. Word Cloud Frequency Urban (left) versus Tiny Houses (right) literature²⁶

TINY HOUSE AS AN AFFORDABLE HOUSING ALTERNATIVE

Micro-housing has emerged as a potential solution to contemporary urban housing crises²⁷ and is aligned with the core principles of Existenzminimum, by focusing on creating space-efficient and affordable housing options based on minimum quality standards.²⁸ However, micro homes have always been part of the reality of different population groups, the recent phenomenon of Tiny Houses is more connected to the US financial crisis in 2008.²⁹ Although the idea of Tiny Houses as an affordable housing solution is mainly disseminated by the media or supporters of the small house movement,³⁰ this statement lacks social and economic evidence to confirm it.³¹ The absence of academic³² and empirical Studies regarding Tiny Houses³³ is justified because it is a relatively new phenomenon that quickly reached a large proportion.³⁴

Data compiled from the analysis were summarised in Table 6. The information is organized to help understand how the authors relate Tiny Houses to affordable housing provision and the role of urban planning in promoting such a relationship. Among the articles reviewed, those that addressed these topics, even if briefly and contextually, were highlighted with a point in the table.

Most studies address urban themes as a background in relation to Tiny Houses. Issues related to the perceptions of Tiny Houses as a housing solution, user experiences and perspectives on space reduction are portrayed through interviews, survey and observation. Many of the authors state that Tiny Houses appear as an alternative for affordable housing, as they would represent a quick and low-cost solution to provide housing.³⁵ However, micro houses require planning as a new form of housing and should be part of urban discussions.³⁶ These conflicts between micro housing and planning regulations limit the recognition of Tiny Houses as a form of housing, creating a barrier to obtaining financing and construction and use permits.³⁷

Other significant obstacles for Tiny Houses are the existence of minimum area standards, which are generally greater than 37m²³⁸ or 40m², which is approximately the maximum size of micro houses.³⁹ Often approached as a low environmental impact solution, micro-houses are seen as an alternative to promoting economic and social justice.⁴⁰ Although other authors consider that it is also a way of covering up poverty and the lack of adequate housing.⁴¹ Another problem highlighted is the lack of research into the demographic impact that micro-houses can contribute, such as the absence of families with children and houses dedicated to single occupation. Despite all these issues, micro houses can be a solution for reoccupying the city by filling existing voids, promoting increased density and bringing the population closer to the centres of cities.⁴²

Micro houses are seen as a positive factor for major cities' degrowth by promoting more compact housing, greater occupation of available land in the city and affordable housing in high-cost urban areas.⁴³ In contrast, some Studies indicate that Tiny Houses are often developed in low-density, single-family configurations that may not align with sustainable urban planning goals.⁴⁴

A recurring problem highlighted in most of the Studies analysed are legal and zoning barriers and the lack of urban planning to include micro houses as a low-cost housing option.⁴⁵ Since the absence of zoning policies and use regulations for Tiny Houses⁴⁶ can lead to an inadequate supply of small spaces or their improper use.⁴⁷ Establishing clear rules in the consolidation of micro house policies could contribute to a diversity of housing supply to meet the specific needs and characteristics of different family groups, especially for low-income population groups.⁴⁸ Some of the suggestions given by the authors to allow different solutions for housing were changes in the size of plot sizes,⁴⁹ density parameters based on concepts of height, frontage and setbacks, Promotion of design innovation and collaboration to find affordable housing solutions.⁵⁰

References	Theme Explanation											Main issues identified and proposals presented by author								
	Tiny house as an urban housing crisis solution	TH as an Affordable Housing Alternative	TH against the higher of rental market prices into inner city	Housing options - variety of types and sizes	Sustainable housing option	Environmental Concerns	Lack of Urban Space	Urban Displacement / Urban-growth	Housing affordability prices impacts	Infill Development	Residential Densities	Policy Interventions	Zoning ordinances, building codes, regulatory barriers	Land-Use Policies and Zoning Ordinances	Urban planning including Tiny House policies	Small-lot development	Minimum size requirements	Tiny Houses out of rental market commercial e.g. Airbnb	Tiny House on Wheels (THOW) as a housing Type in local planning schemes	Legitimize TH through planning and building approvals to allow financing and insurance
Ford e Gomez-Lanier, 2017	●	●	●		●	●	●		●					●	●					
Huebner e Shipworth, 2017					●	●														
Alexander et al. - 2018		●				●		●		●		●	●							
Brokenshire - 2018	●	●										●	●	●					●	●
Butt e Stephenson - 2018												●	●							
Clinton - 2018	●									●					●	●				
Lau e Wei, 2018	●	●	●	●						●		●	●							
Penfold et al. - 2018					●												●			
Shearer et al. - 2018	●	●			●							●	●						●	●
Weetman - 2018							●			●	●	●	●	●	●					
Wotton et al. - 2018	●			●	●									●	●		●			
Boeckermann et al., 2019																	●			
Brysch, 2019	●	●		●			●	●	●			●	●				●			
Evans, 2019										●		●	●						●	●
Lutz - 2019					●	●														
McKinlay et al. - 2019		●			●	●		●												
Shearer e Burton, 2019		●				●						●	●		●	●				
Evans, 2020	●	●																		
Harris e Nowicki, 2020	●	●				●					●	●	●							
Jackson et al., 2020		●																		
Evans, 2021	●	●										●	●	●	●				●	●
Glumac, 2021		●			●	●	●					●	●	●	●		●			
Preece et al., 2021	●		●	●	●	●	●	●	●											
Shearer e Burton, 2021		●			●		●					●	●		●	●			●	●
Evans, 2022		●																		
Lessard, 2022	●	●		●	●	●						●	●		●	●			●	●
Murillo e Bianchi, 2022				●																
Riggs et al., 2022	●	●										●	●		●	●				●
Summers, 2022		●							●											
Wilson et al., 2022															●					
Zhang et al., 2022		●			●	●						●	●	●	●					●
Margier, 2023												●	●	●						
Wilson e Wadham, 2023	●	●	●	●								●	●	●	●					
Anacker, 2024	●	●		●							●	●	●	●	●					
James e Shahab, 2024		●							●			●	●	●	●		●			●
Lehner et al., 2024				●			●	●				●	●	●	●					●
Tucker et al., 2024	●	●		●			●	●	●	●	●	●	●	●	●		●			●

Table 6. Summary Analyses of main points observed from this studies review

CONCLUSION

Urban planning and regulatory frameworks play crucial roles in shaping the availability and accessibility of housing options. The literature indicates that regulatory barriers can significantly impact micro-housing development. These research papers highlight the importance of diverse housing policies to meet various household needs. However, there is often a mismatch between housing policy and actual needs. To address this, cities are exploring compact housing options such as micro-units and accessory dwelling units that can provide affordable housing and support urban infill goals. Regulatory challenges in developing these units vary across jurisdictions, necessitating careful consideration of the zoning and building codes. For future research, the authors indicate that a variety of approaches and a diverse range of themes are necessary to realize in-depth analysis of this subject, as we can see in *Table 7. Future Research suggested in reviewed studies* Table 7. Finally, as a new phenomenon, more research is needed to confirm Tiny Houses as an affordable housing option and what paths are needed for it to no longer be an instrument of the property and inaccessible for Low-income Groups.

Future Research

Tiny House Post occupancy evaluations

Affordable Housing Solution

Empirical evidence

Key success factors to adopt Tiny Houses

Tiny Houses Community Design for specific purposes, e.g. homelessness, ageing-in-place, students

Tiny House users and socio-economic profiles

Tiny House barriers and motivations for users

Desirable micro housing features for downsizers

Incentives for downsizing and the rate response probability

Policy Measures Impact on downsizing / Tiny House promotion

Clarity and accommodating regulations regarding Tiny Houses

Build regulations for Tiny Houses

Planned Integration of Tiny Houses into urban areas

Infill Development in the inner city

Clarification of Tiny House Definition legally within the codes

Analyses of the growing up of Tiny House phenomena

Table 7. Future Research suggested in reviewed studies

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REINVIGORATING THE UNDERSTANDING OF VITRUVIAN ‘COMMODITY’ FOR BUILDING CULTURAL RESILIENCE IN LIVABLE CITIES

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INTRODUCTION

This paper argues for an architectural practice based on careful and detailed observation, diagramming and description in order to understand and accommodate culturally specific traditions and behaviours; a reinvigoration of the Vitruvian idea of ‘commodity’. The argument takes its initial cues from lessons learned during a detailed investigation of an impoverished marginalized and sometimes violent African American neighbourhood in the heart of New Orleans, Louisiana.¹ The neighbourhood has one hundred active churches within an area of less than two square miles.

The buildings are central to the community and well cared for, but architecturally plain. However, careful study of the actions of the people in the neighbourhood reveal that the architecture supports the action in ways that were not anticipated. Investigating details of the church architecture relative to these activities further clarifies the relationship between human activity and architecture. Finally, the buildings and the activities they support are attributed with making a more substantial contribution to neighbourhood wellbeing than policing, governmental intervention to the infrastructure and social assistance programs.



*Figure 1. Church on Martin Luther King Boulevard, New Orleans.
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The study extends our thinking to appeal for architectural practice to be attuned to the finer details of programming; careful listening and observation that clarifies and determines how communities use their buildings to reinforce cultural values and allow users to feel ‘at home’. Attentive observation of cultural practices can advance architectural practices, leading to healthier supportive environments. Investigation of this relationship calls for a reinvigoration of our understanding of ‘commodity’ to be culturally sensitive. The Roman architect Vitruvius determined ‘commodity’ to be among the three most important aspects of excellent architecture along with ‘firmness’ and ‘delight’. Reinvigorating our understanding of ‘commodity’ promotes understanding of how architecture shapes and is shaped by human activity, especially activity which may be less familiar. Such well attuned observation can assist in designing for both familiar and unfamiliar environments. It can also assist in the education of our architects and urban designers.

Observation – learning from unfamiliar patterns

This investigation developed from a study of a marginalized African American neighborhood in New Orleans, where more than one hundred active churches of various denominations and sizes are located. During the initial fieldwork, by accident, I had come across a group of community members surrounding a preacher. Returning to the neighbourhood the next day, the people were gone. I asked where the church was. “You’re standing in front of it!” was the response. I soon discovered that there were more than 100 churches in the neighbourhood. Many were undecorated. Some were almost architecturally invisible. All were active.



Figure 2. New Hope Baptist Church, New Orleans © Jill Bambury

Paradoxically, the architectural modesty of the buildings was my first introduction to their specificity. It was soon learned that despite their architectural simplicity, and the challenged neighbourhood in which they are built, they provide social, cultural, and spiritual support. Further study revealed the mechanisms by which both subtle aspects and details of the design of the churches contribute to the

culturally specific and robust activities of their communities. This occurred for both interior rituals and outside activity, such as neighbourhood revivals.

Upon closer examination, it was found that the architectural and spatial configurations responded to culturally specific requirements of accommodation. The study of how the churches are used by their congregations and leaders directed further reflection. This began to suggest a methodology for how architects can learn from close study of the cultural practices of a community in order to design buildings that respond to its needs and values. The approach to this problem is especially important as we design to accommodate changing demographics of cities and engage more extensively in global practices. The issue of designing to accommodate culturally specific activity calls for a reexamination of the three principles of excellent architecture proposed by Roman architect Vitruvius.²

Commodity- appropriating unfamiliar activity

In his Ten Books of Architecture, Vitruvius described *commodity* as one of the three aspects of excellent buildings along with *firmness* and *delight*. The English word **commodity** is the translation of the Latin word *commoditas*.³ It means ‘fitness’, ‘adaptation’, ‘convenience’ or ‘advantage’.⁴ The Latin term combines *com* with *modus* meaning “**measure**” or “**manner**”.⁵ So, at its core, “**commodity**” refers to something that is “**useful, appropriate, and advantageous**”. It might be thought of as referring to a method, mode or way of accommodating in an appropriate manner.⁶

Expanding this notion to the city, Joseph Rykwert describes **commodity in The Seduction of Place**. He writes “This term refers to the **usefulness and functionality** of a place or building. It emphasizes accommodation, practicality, and meeting the needs of its inhabitants. In architectural terms, it relates to how well a space serves its purpose, whether it’s a home, a public square, or an office building”.⁷

This may seem like a reasonable requirement to fulfil. Yet, Yet, commodity is not universal. There are differences in the comfort specificity of the users. For example, teacher of English as a foreign language tells a story of how her students, a group of Vietnamese newcomers to Canada waited for the pedestrian crossing light to change at a street crossing in their first days in the city.

*As the light turned red, they looked at each other, then one by one assumed a squatting position to wait.*⁸

Consider another example.

*A group of scientists from tropical China working with Canadian scientists in the Canadian North suffered less from cold exposure while sleeping than their Canadian counterparts. When design students speculated about the reasons why, they guessed that the Chinese had more well-designed sleeping bags. This was not correct. Nor was speculation that the Chinese had eaten spicy food. Rather, the Chinese scholars were comfortable sleeping very close together. Canadians preferred greater social distancing.*⁹

However universal the acts of sitting, eating, sleeping, bathing and gathering might appear, there are many cultural differences in the way they are done. If the universal act of sitting (or eating or sleeping) is culturally determined, how then do we work to accommodate activity which is even more culturally specific; activity that may not be performed in all cultures? Why is this important?

Think about a time when you were less than comfortable. Maybe this was on a crowded bus in Rome or during an attempt to use chopsticks in front of Chinese colleagues that you did know well for a dish that you had ordered that was far too spicy. Lack of comfort might have to do with familiarity of religious customs. You may not understand the Hebrew at a Bat Mitzvah, the outdoor preaching and revival at a Black church in New Orleans or why there are no chairs in a mosque. You may not know the Neapolitan etiquette of peeling a pear with a dessert knife and fork at a formal dinner.

These examples clearly extend beyond individual actions to collectively understood and temporally extended activities. While in Rome, a morning coffee might take three minutes and be drunk standing

up, in Beirut coffee might be taken over several hours with many dishes, in Pakistan, coffee might not be drunk at all! A wedding ceremony in Cajun Louisiana will be totally different from a Jewish wedding ceremony in the same place. Activities which occur in places where community gathers might require culturally specific accommodation.

It is easy to make architectural mistakes if culturally specific activities are not well understood. For example, the prize-winning architect Charles Moore's *Piazza d'Italia* in New Orleans tried to bring the Trevi Fountain to the city hosting the World's Fair.¹⁰ While spectacular at the outset, in the end it did not succeed. Rather, the piazza soon became a ruin and a homeless encampment. Finally, with the marble stripped from the facing, it was abandoned and finally demolished.¹¹ The cultural reality is that New Orleanians do not gather in piazzas.

In his essay *On the Sitting Position- A Question of Method*, Joseph Rykwert presents the idea that even the most basic human activity of sitting can have many ways of requiring comfort.¹² He illustrates with a Ghanaian chair/headrest as opposed to a Miesian chair. This is fascinating when posed to American students of Architecture in consideration of the 'la-z-boy' as the quintessential North American chair.¹³



Figure 3. 'La-z-Boy' style chairs.

Although the comfort we find in sitting might be initially considered to be universally prescribed, even this basic human act can be culturally specific. The example could be easily extended to acts of bathing, eating and sleeping.



Figure 4. Could Mies' Barcelona Chair accommodate Rodin's "Thinker"?

These examples cast shadows on the whole idea of comfort and accommodation. While beauty or delight, the third of the Vitruvian trinity, has been a slippery architectural term since the eighteenth century, it now seems that the universality of the definition of comfort might also be called into question.¹⁴ How do we accommodate cultural practices that we do not understand? This question is

especially poignant when lack of familiarity with the cultural practices of our clients and users can result in mistakes in our work. Our designs might make our cities exclusive or uncomfortable for people to inhabit. Hence, while we may be attentive to cultural specificity for activities such as religious services, which may have carefully prescribed architectural specifications, the aspect of comfort is sometimes overlooked for even the most basic needs in our designs, from a chair to a city.

Adjustments – Accommodating changing demographics

The demographics of cities are changing. As we readjust our lives to deal with the effects of world conflict, climate change and pandemics, cities and their designers are also called upon to readjust. It is predicted that by the year 2050, sixty-eight percent of the world's population will be living in urban areas.¹⁵ We can expect more migrations of people and new communities in our cities.

Although we are usually aware of less familiar cultural activity, we may not consider it closely. Immigrants may be unfamiliar with local traditions and newcomers will bring cultural traditions to the city that may be unfamiliar to the inhabitants. Communities comprised of victims of war or refugees of climate change may find themselves living in totally unfamiliar parts of the world. These locations could have radically different climates, food sources, activities – a foreign way of life.¹⁶ How can a designer respond?

Digital media, communications and even digital travel have expanded architectural and urban design practices. As designers, we are called upon not only to accommodate diversity among inhabitants our own cities, but also to design for communities on the other side of the world. Both the American Institute of Architects (AIA) and the Royal Institute of British Architects (RIBA) report increases in international work.¹⁷ RIBA Benchmarking reports that large firms (one hundred employees) or more reported a 43% increase in international work in 2023-2024.¹⁸ Global practice is expected to continue to grow.

Collectively, the increase in world migrations, the influx of newcomers to urban areas and the growth of international practice for architects and urban designers reiterate the looming question. How do we work as designers with communities that might be culturally unfamiliar to us? The prospect activates exciting design possibilities, but also presents complications.

This has been noted by others. For example, Helen Taylor writes “An orange grower with no trees can do little with his accumulated skills in inner-city London and a university-educated refugee may find his perceived “foreign-ness” and limited English reduces the opportunities he had invested in through education. The loss of social capital can also have repercussions down the generations”¹⁹ As discussed, we may not understand the culture for which we are designing. We may not provide the most useful design solutions. Furthermore, ethnically representative architects “continue to face challenges entering the field. In 2022, only 3% of newly licensed architects were Black, compared to 70% who identified as white, 15% Asian, and 10% Hispanic and Latino, according to the National Council of Architectural Registration Boards' 2023 report.”²⁰

Not So Universal Acts

The concept of universal design “of products and environments to be ... flexible” and provide “a maximum inclusion of all people” is valuable when designing for equity and inclusion.²¹ However, sensitivity to issues of cultural importance may be eclipsed by the idea and practice of ‘universal design’. New immigrants may have different concepts of ‘accommodation’ from the cultural norms of their new places.

This problem is exacerbated when the owners and users of the places we design are different. We may not be able to hire a ‘culturally specific’ designer or even to involve the community of users.²² However, we can carefully study the actions of the people to understand how the architecture can support them. We can encourage and educate our students in these sensitivities and techniques. The call is for closer

examination of the phenomena around us and how we engage with our environments. We can learn to scrutinize community activity for cultural specificity.

Returning to the Churches

The study of the Black churches revealed more than simply the unusual plainness of the facades. Despite socio-economic challenges, the Black neighborhood in New Orleans which is home to a hundred active churches is rich in culturally specific community values.

The churches ‘stand out’ in the challenged neighbourhood. The buildings and their grounds are clearly ‘cared for’. Each is surrounded by a chain linked fence. The small lawns are green and mowed. The doorknobs are shiny. The bricks are newly pointed. The interiors of the churches smell of soap.



*Figure 5. Church and Yard, New Orleans.
© Jill Bambury*

The architecture supports cultural traditions that transcend generations: cornerstones dedicated to the founders; gospel music performances; ceremonial parades of social clubs and Mardi Gras ‘Crewes’. Each church hosts a particular set of rituals, dress codes, liturgies and music; sometimes operating as ‘family businesses’ through generations. The churches do not often have visitors. The buildings are meticulously maintained for owners and users and not for the public. Careful study of the buildings relative to the activities each supports allows the relationship between human activity and architecture to become increasingly clear. Often hidden from the uninitiated, these activities contribute to community strength more than policing or governmental interventions. They codify community protection, inclusion and exclusion. The beautifully cared for church buildings in a historically and currently marginalized Black neighbourhood in New Orleans points to fulfillment of a culturally specific ‘commodity’.



Figure 6. Gospel Attende in church Ladies' Room, New Orleans.

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CONCLUSION

Drawing from a number of specific situations, this paper has argued that critical observation of cultural practices can inform design practices from chairs to cities, leading to healthier, more accommodating environments. Reinvigorating the importance of Vitruvian 'commodity', the paper allows a more attentive, respectful and articulate approach to listening and observing how people use their buildings, as a way of creating healthier and more inclusive environments.

Although initially, these studies may seem most appropriate to social sciences, they clearly belong to the design of cities and buildings. Architectural practice can be more attuned to consideration of commodity; through careful listening and observation that clarifies and determines how communities use their buildings, neighbourhoods and cities to reinforce cultural values, allowing users to feel 'at home'.

Understanding the relationship between community behaviour and culturally sustainable cities reinvigorates the importance of 'commodity' which the Roman architect Vitruvius determined to be among the three most important aspects of excellent architecture along with 'firmness' and 'delight'. Careful observation of cultural practices can directly advance architectural practices leading to healthier environments. Well attuned observation can assist designing for both familiar and unfamiliar environments. As we refine our understanding of cities around the world, and embark on global practices which are cognizant of theories, challenges and events that define them, we discover our own positionality, as designers of cities we study, but also as world inhabitants.

NOTES

- ¹ Author's fieldwork for doctoral dissertation.
- ² Marcus Vitruvius Pollio, *The Ten Books of Architecture*, Book I.
- ³ Pollio, *The Ten Books of Architecture*, In Latin, these are: *commoditas*, *firmitas* and *venustas*.
- ⁴ Oxford English Dictionary (oed.com) Accessed 6-5-24
- ⁵ Oxford English Dictionary (oed.com) <https://www.etymonline.com/word/commodity> commodity, n. meanings, etymology and more Accessed 6-5-24
- ⁵ *Oxford English Dictionary*
- ⁶ Oxford English Dictionary (oed.com) <https://www.etymonline.com/word/commodity> commodity, n. meanings, etymology and more Accessed 6-5-24
- ⁷ Joseph Rykwert, *The Seduction of Place: The History and Future of the City*, 2002.
- ⁸ Paulette Godwin quoted in author's fieldwork, 2022.
- ⁹ Canadian Broadcasting Corporation (CBC) *Ideas* radio program.
- ¹⁰ Charles Moore, "Piazza D'Italia", 1980.
- ¹¹ Luz Elena Ramirez, "Urban Palimpsest", 1997.
- ¹² Joseph Rykwert "On the Sitting Position", 1957.
- ¹³ La-Z-Boy advertisement.
- ¹⁴ even defined as having a certain "*je ne sais quoi*"
- ¹⁵ United Nations Department of Economic and Social Affairs News 16 May 2018. <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html> Accessed 6-9-24
- ¹⁶ Helen Taylor, p149
- ¹⁷ AIA Firm Survey Report Accessed 6-9-24
- ¹⁸ Practice revenue is up – by 17% – but even higher costs leave architects in a profit squeeze | RIBA Accessed 6-9-24
- ¹⁹ Taylor, P.149
- ²⁰ <https://stacker.com/art-culture/9-black-modernist-architects-and-landmarks-they-designed> The share of Black architects has only gone up 1 percentage point since 2018
- ²¹ Udinstitute.org
- ²¹ AIA reports

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THE COLLAPSE OF HOUSING BUBBLE IN CHINA: NEW POWER AS NEW FORMS OF LIVING

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INTRODUCTION

This paper's primary objective is to explore the new forms of living in China's 'post-real estate era', which China had entered after real estate developers lost their absolute share in China's housing industry in the 2020s. These new forms of living will be profoundly influenced by changes in power relations between the government, developers, and citizens resulting from the fall in land and housing prices and the rise of real estate tax. The burgeoning middle class, which has emerged in the hundreds of millions in the last two decades, will be a crucial subject of inquiry in this thesis. How this group could exert influence in the housing system, fight for their agency, cooperate with the government/developers, and ultimately establish a new housing system?

CAPITAL, POWER AND URBANISATION

Following the reform and opening up of the 1980s, China's urban development movement has been widely regarded as an economic development model dominated by government's power and developers' capital, with the aim of maximizing land and space benefits as quickly as possible. In this model, China's urbanization rate grew rapidly from under 20% in 1978 to over 60% in 2019.¹

At same time, after the tax-sharing reform in 1994, local governments in China were wildly faced with financial difficulties and had to resort to "land finance" as solution,² which led to a surge in land and housing prices. Local government's dependence on land finance created a strong alliance between the government and real estate developers, which has been wildly criticized as unjust and non-transparent.³ Citizens, including landowners and residents, have been alienated partially from participating in the urbanization process.

After experiencing rapid economic growth for almost forty years, the Chinese government's land finance policy has also become unsustainable in the 2020s. The excess housing supply and exorbitantly high prices have pushed the real estate industry to the brink of collapse. In the logic of financial capitalism, real estate is seen as an object of investment rather than a necessity for human habitation.⁴ To address this issue, Chairman Xi Jinping stressed in his address to the Nineteenth Party Congress in 2017 that "Houses are built to be inhabited, not for speculation." This manifesto also reflects the end of China's land development strategy. After over two decades of the golden age, the logic of (state) financial capitalism has finally ended in China's housing system.

Opportunities for new forms of living

In 2021, the Chinese government initiated a pilot real estate tax reform program to fill the financial gap for land sales.⁵ This reform is considered government’s core policy to ensure the stability of local government finances. It is reasonable to assume that the resources of government finance will gradually shift from private capital (real estate developers) to property owners (citizens). As the result, the alliance between the government and real estate developers will gradually weaken, and a new power relation will form in the housing system, creating diverse opportunities for new forms of living (Figure 1.).

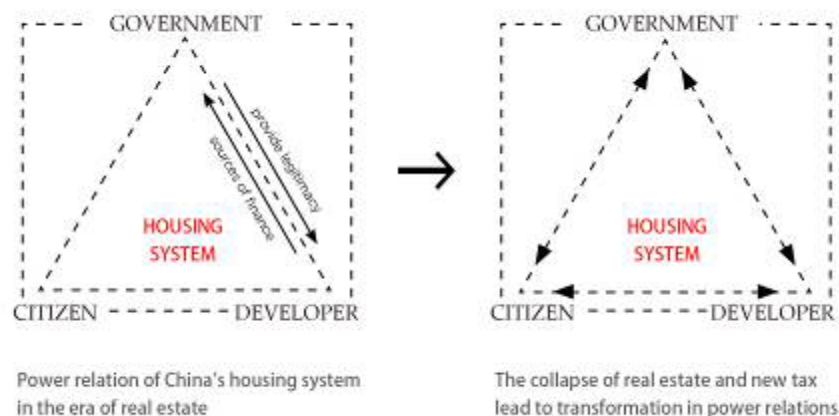


Figure 1. Real estate crisis bring opportunities for new forms of living.

TOWARDS HOUSING SYSTEM REFORM

The failure of financial capitalism

In China today, more than 90% of urban housing is supplied by real estate developers, which distorts the overall housing supply in China and creates a serious tendentious housing shortages.⁶ These profit-driven developers always tend to develop housing projects (for investment) that cater to the middle-high-income class with higher profit rather than developing affordable housing (for living) with social care attributes for low-income earners (Figure 2.). In fact, similar real estate crises are not unique to China. Despite the differences in political and cultural contexts, the failure of financial capitalism logic in the housing system seems to be no different in countries (Figure 3.).

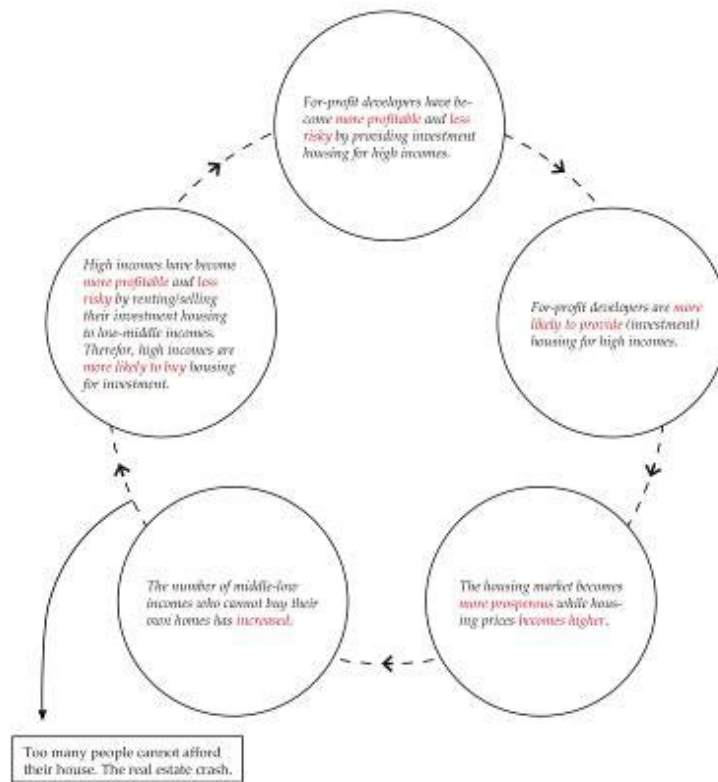


Figure 2. The endless chain of tendentious housing shortage led by for-profit developers.



Figure 3. The global real estate crisis caused by financial capitalism.

New logic towards new forms of living

Once the land finance model reaches its end, the government-developer alliance will no longer be able to maintain. Due to the coming of the real estate tax, the new middle class in Chinese cities, who have accumulated wealth rapidly during the urbanization wave, will become the group that lose benefit from this important reform. This group of people often has received better education, has decent jobs and higher incomes, and often owns two or more properties (housing) in urban areas, making them the primary taxpayers of the real estate tax in the future.

For China's emerging middle class, they have corresponding wealth, as well as organizational and action capabilities brought by knowledge. Their power and government's dependence mean that their demands will no longer be ignored in the new era. Furthermore, how to form a new cooperative relationship with this emerging and action-capable group will be the primary task of the government and developers. Due to the new real estate tax policy, the middle class will gain the influence they deserve in the housing system, giving them power to determine their living forms. This thesis attempts to showcase the pathways of two distinctly different new forms of living, which are also two very different urban imaginations toward the future of post-modern China (Figure 4.).

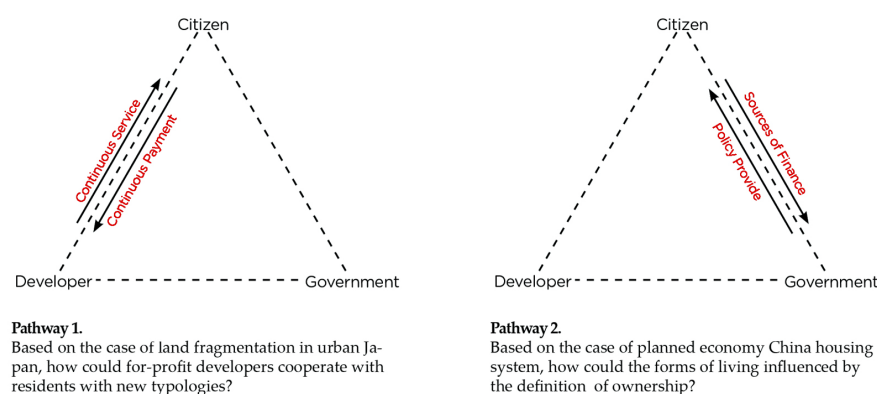


Figure 4. Two different pathways of the China urban imagination.

THE LOGIC OF NEO (FINANCIAL) CAPITALISM

Naturally, modernism, housing, commodities (industrial goods), investment and finance were linked together as irreplaceable parts of market economy society.⁷ Some famous (and negative) examples include the housing collapse during the Great Depression in the United States in the 1920s, Japan's economic bubble burst in the 1990s, and China's current real estate crisis in the 2020s. These events demonstrate the inextricable link between architecture (real estate) and economics.

Under the logic of (financial) capitalism, the collapse of a housing system based on investment housing construction is inevitable. The profit-driven logic somehow conflicts with the most basic human needs, the living. This part represents an empirical urban imagination: how real estate developers continue to exist in the new housing system? The continuation of this existence does not require a change in their profit-driven nature, but rather a transformation of the living form and development mode of urban housing through cooperation with the emerging city middle class in China's cities.

The 1990s Japan as projection

The real estate bubble crisis in Japan in the early 1990s could be considered as a perfect projection for this topic, especially consider about the close relationship in culture context and society.⁸ This part attempts to bring similar thinking into China's high-rise, high-density urban fabric.⁹ With the decline in housing prices and the implementation of property taxes, what kind of residential demands will China's urban residents need?

In particular, compared to Chinese cities that are filled with high-rise, reinforced concrete residential compounds, Japanese residential areas exhibit a low-rise, high-density fractured feel. Most houses in urban areas are independent units with small footprints arranged side-by-side, with only a narrow path separating them. Some research considers this phenomenon as the traditions of Japanese society.¹⁰ However, Japan's highly fragmented urban texture is not only rooted in its longstanding cultural tradition of small houses, but also to the most practical economic factors, especially the influence of the 1990s economic crisis.

Urban fragmentation and economic rational action

In Japan's urbanization wave after World War II, the area of urban suburbs was continually consumed and divided into multiple blocks, giving rise to the urban segmentation pattern. Especially in the 1980s and 1990s, the land had become the scarcest and most sought-after investment product in Japan. As result, a series of economic games revolving around land began to play out among the government, developers, and landowners.

Firstly, with the rise in land prices came the sky-rocketing (property) inheritance tax. In 1985, the land successor in Setagaya-ku (one of Tokyo's core areas) had to pay JPY 50 million in inheritance tax for the 240 square meters of land left. In just five years, by the early 1990s, this amount had soared to JPY 350 million.¹¹ The soaring inheritance tax reflected the irrational land/housing prices of Japan's 1990s bubble economy. Therefore, large-scale land were more likely to be divided into several parts between generations because high inheritance taxes would be incurred when a family engaged in inter-generational inheritance. Whether distributing the divided properties to different children or selling part of the land, these were all ways to avoid high inheritance taxes.¹²

With the development of generations, the land area of each family gradually became smaller. The increase in land prices and inheritance taxes in Japan has divided urban space into smaller plots. As a result, housing forms and family organizations have also changed naturally. Till today, Tokyo, as a major metropolis, has undergone multiple rounds of land division over the years. The entire land of Tokyo has been divided into countless small particles, which are detached residential units of less than 100 square meters each.¹³

Japan's experience could be projected onto China as a precious example, especially as China begins implementing a real estate tax policy similar to Japan. The economic rationality behind Japanese landowners' actions to divide the land between generations should be a significant reference point for China. It is particularly relevant in architecture, highlighting the importance of sustainable and responsible land management practices for future generations.

Space cutting as the new forms of living in Urban China

With the gradual implementation of property taxes in China, the city middle class, which has risen in the last few decades, will face the same dilemma on how to minimize the losses in the new property tax policy. Space cutting and generational transmission will become the core element to discuss based on this logic. With China's high-rise and high-density urban context, this process of space fragmentation will be implemented in the residential building rather than on the land itself (Figure 5.).

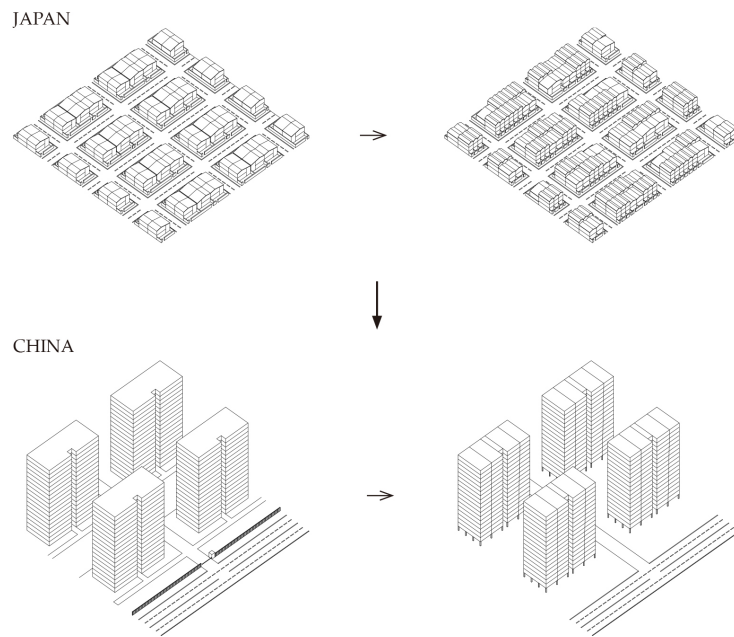


Figure 5. Space cutting/generational transmission as the core method in China.

A new architectural framework will be built, which considers the building as the object to be fragmented. The whole building will be considered a flexible and continuable framework rather than a disposable, immutable industrial product. By utilizing a central core space for residential infrastructure such as electricity, water and plumbing, and two flexible spaces on either side, this architectural framework aims to provide residents with the ability to adjust the size of their living (whether it is expanded or shrunk), in response to changes in real estate taxes and living cost across generations (Figure 6.).

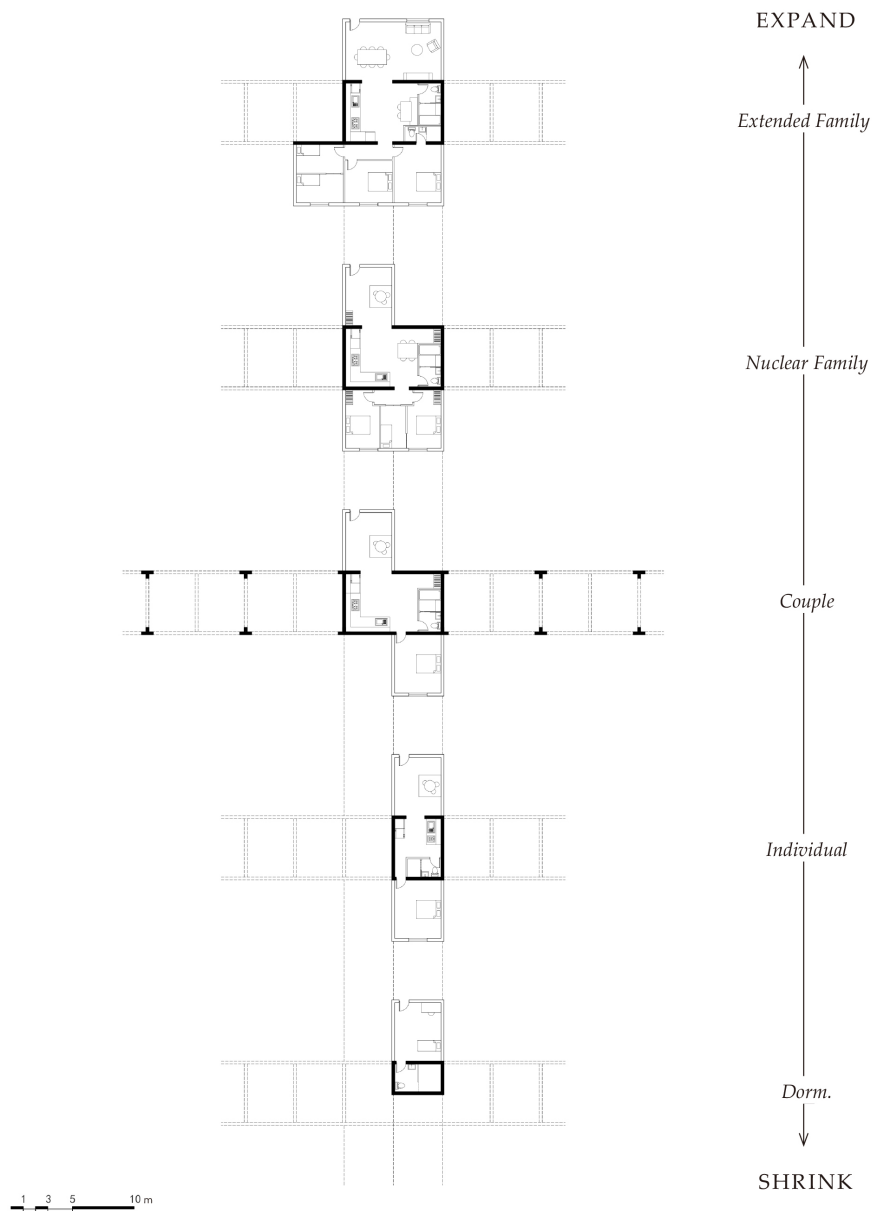


Figure 6. The architectural framework based on space cutting.

Considering the unique ownership system in China (in China, land always belongs to the state due to the law, and buyers generally only own the house and have 70 years of right to use the land), this approach is also particularly relevant in the high-rise and high-density urban context.

This design based on new architecture framework attempts to imagine a new form of living based on economic rationality for Chinese residents in the post-real estate era. Moreover, such a urban imagination also presents a narrative of compromise and collaboration between residents and for-profit housing developers in the new era. It will also strongly influence the forms of urban China in the future (Figure 7.).

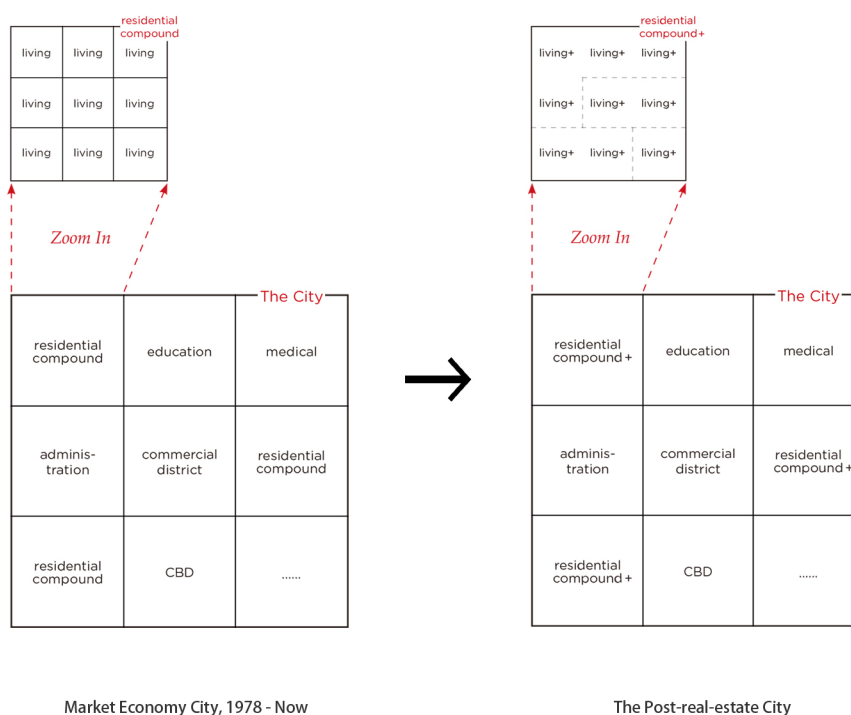


Figure 7. From market economy city to the post-real-estate city.

THE LOGIC OF OWNERSHIP

Comparing the discussion based on the flexible framework, the other attempt is to go beyond the identity of (housing) ownership. Only with ownership can housing become a property that can be managed and traded. Following the market economy reforms since 1978, socialist China has undergone a very long process of rethinking ownership (especially housing ownership).¹⁴ The basic logic of contemporary urban development in China is rooted in the neoliberal privatisation strategy after 1980s. In addition to privatising public housing that was initially state-owned, most of the new housing built by real estate developers is also privately owned. However, this logic of financial capitalism is a double-edged sword. The collapse of China’s housing system also stems from excessive speculation in the real estate market. Therefore, reconsidering ownership will prevent from falling into the trap of speculation again. When housing prices are constantly declining, a question should be asked to every Chinese: do we still need to “own” housing (Figure 8.)?

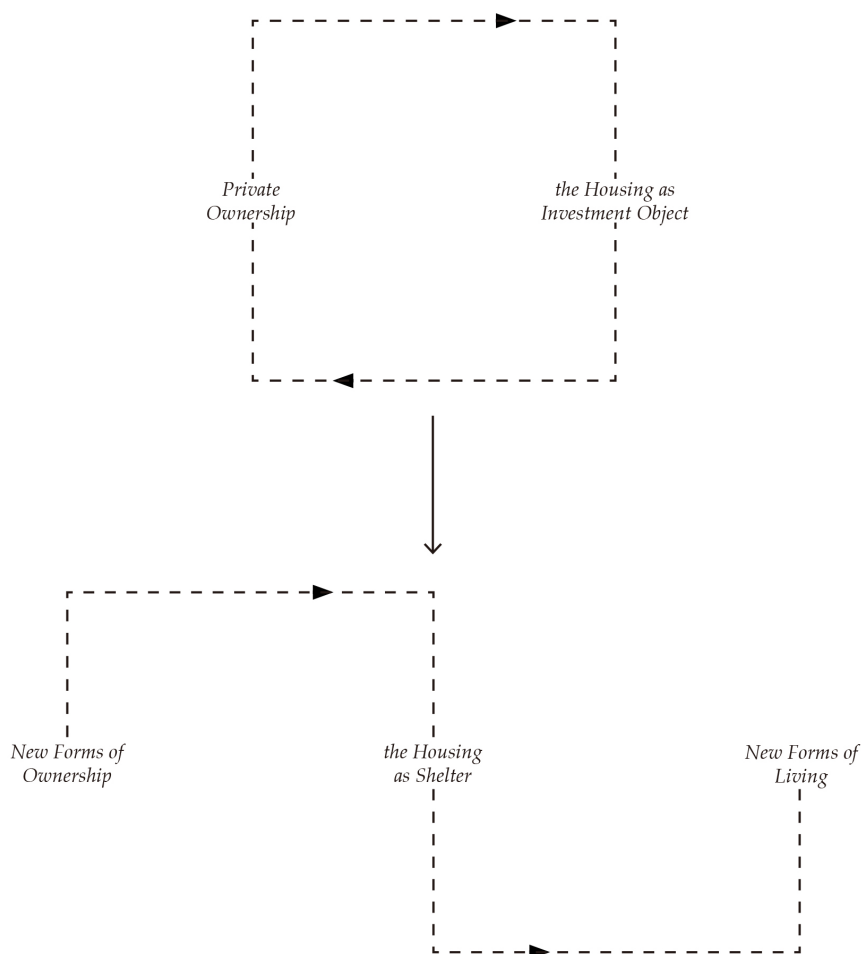


Figure 8. The new forms of ownership as the new forms of living.

The transform of ownership and living forms

To understand how ownership influence urban living. Different scales, including the living units, community, and city, should be compared between the public housing system, danwei, in planned economy China from 1949 to 1978, with the private-owned urban housing forms, xiaoqu, which have dominated China’s urban context since 1978. This comparison aims to understand the relationship between different housing types and ownership systems.

“Toward collectivism” and “private interests first”

From 1949 to 1978, the public housing units in “danwei” strongly emphasise shared spaces and collective living. Apart from the most basic privacy space (bedrooms), residents of each floor share living infrastructure such as kitchens, toilets, and even bathrooms. Residents can enhance their collective sense of belonging to their danwei (and working place), which is a value that is highly cherished in communist ideology and planned economy China.¹⁵

After 1978, Chinese government implemented a neoliberal housing system reform, gradually making real estate developers the primary housing providers in China. Thus, “xiaoqu” gradually became the most common living sector for urban residents. In each “xiaoqu”, all shared spaces have been removed.

Every inch of space, except circulation, is owned by “someone”. The logic behind is straight forward: every inch of space has clear ownership, respecting every yuan the residents have invested and the private ownership of investors.

“The picturesque scenery” and “the capitalize space”

In the scale of community, comparing with “xiaoqu” which are designed based on the rationality of commodity society, the danwei public housing was more like “an idealistic picturesque scenery”. Taking Caoyang new village, the first public housing project in Shanghai after 1949 as example: “the community planning is spacious. Nine residential areas are separated by a large number of natural waterways, parks, and green spaces, creating an aesthetically pleasing environment without sparing costs in public spaces”. “The housing is interspersed between various clusters along roads, water bodies, commercial streets, schools, canteens, and hospitals, forming a complex scene with natural landscapes and public facilities.”¹⁶ These public housing did not follow the commercial logic of “maximizing land development benefits” but instead aimed to create new socialism spatial lives through the idealistic “garden village.”¹⁷

The open spaces in xiaoqu have generally simple recreational facilities and decorative designs, manifesting as circular flower beds, fountains, and garden landscapes with obvious artificial traces. However, they are usually only used as landscapes rather than social activity spaces.¹⁸ The lack of social functionality in these open spaces can be understood. Firstly, the cost of these areas is also calculated in the cost of purchasing a property. Therefore, when the housing is considered as investment object, it is obvious that low cost of open spaces is more profitable for investors. Secondly, under the guidance of modernism urban development movement in China, xiaoqu has become “residential machine.” Chinese urban residents rarely need to complete programs in these open spaces. “If they need to appreciate natural landscapes, they can go to parks in the city; if they need to get together with friends, they can go to malls, cinemas, or restaurants. All activities point to another part of the city.”

“The enclosed programs” to “the exclusive space”

The programs in danwei included dwelling, workplaces, education, health, and leisure facilities. This spatial concept aimed to make people living in danwei as self-sufficient as possible. This space’s side reveals China’s anti-urban tendency during the planned economy era.¹⁹ The city is viewed as a collection of countless villages (danwei) that can be self-sufficient. Therefore, urban texture of planned economy China shows single and complex state at the same time. “Single” means the entire city is composed of danwei with same spatial structure, while “complex” refers to the rich and diverse programs and activities presented in each danwei, making the daily life of residents tend to be complex. On the other hand, the form of Xiaoqu closely related to the market-oriented reform of housing system. In the process of abolishing the danwei system and privatizing the public housing within it, various programs in danwei have been shut down and marketized. The result is the disconnection of programs from the original residential community. Instead, privately owned programs that are selected by the market have become independent blocks in the city. Xiaoqu is more of a specialized space and results from capitalist urbanization.²⁰

Rethinking the ownership: the neo-homogeneous city

When housing is viewed as national welfare and a tool for cultivating collectivist spirit, danwei’s public housing demonstrates the importance of collective life and public spaces at all scales of living units, communities, and cities. Conversely, when housing became a private property and investment object, maximising its owners’ profits became the essential logic for xiaoqu. This logic further led to simplifying open space in xiaoqu and separating programs in the entire city.

This discussion of ownership lead to a “communist-style” urban imagination. With the collapse of the real estate market, the value of housing as private property has been diminished; it is no longer a profitable investment but more a shelter for the human body. Based on this premise, residents will collaborate with the government to construct public housing at a cost price (state-owned housing). Urban residents continue to pay rent and property taxes for this new housing system. Then, a new form of urban living can be established through the cooperation between residents and government with the transformation of housing ownership. Based on such logic, a new mega-complex living system could be imagined in city China (Figure 9.). Due to the change in housing ownership, the more significant change is the texture of the whole city. It will gives the “legitimacy” of diversity programs a chance to get involved of urban living rather than an isolated block from the residential sector. This, in turn, gives the city and urban residents infinite possibilities for new living forms (Figure 10.).

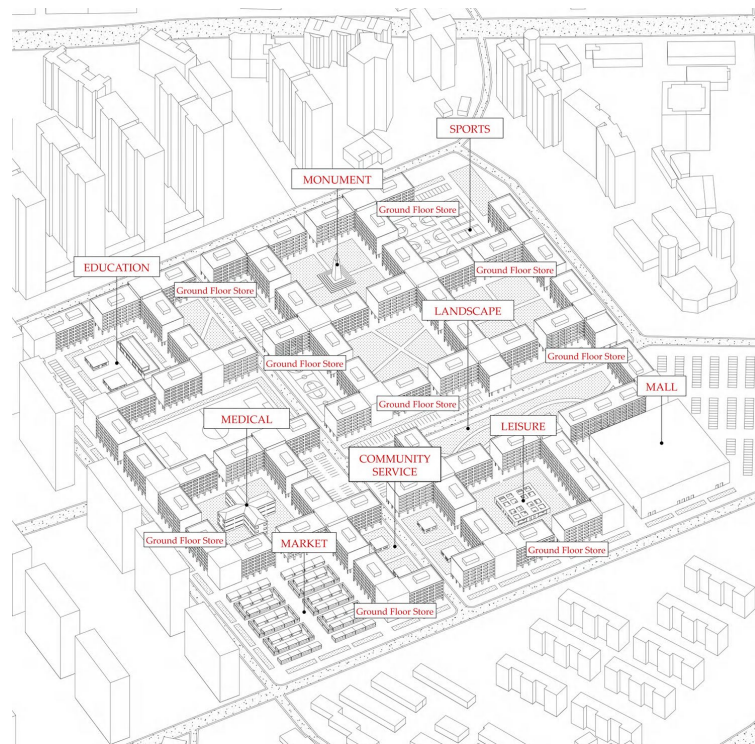


Figure 9. The new ownership framework gives the legitimacy of diversity programs a chance to be part of urban living.

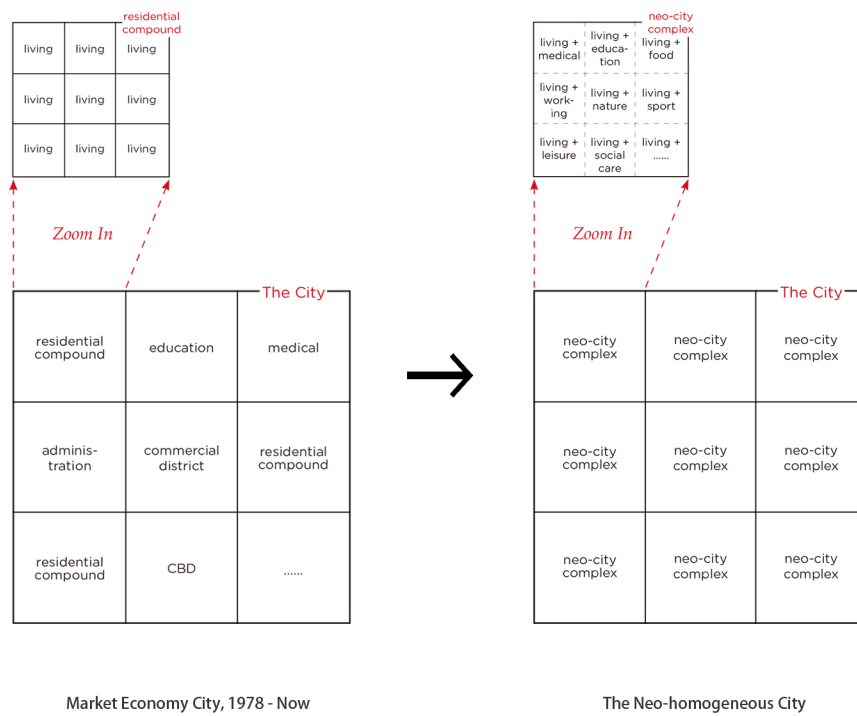


Figure 10. From market economy city to the neo-homogeneous city.

CONCLUSION

The transformation of China’s housing system since 1949 is, in a way, a reflection of the difficult and crucial transformation that this ancient and vast country is undergoing. Therefore, through the field of architecture, this thesis aims to provide a framework for understanding and reviewing China’s modernization process, using the collapse of the Chinese real estate system in the 2020s as a starting point. The thesis presents two abstract urban imaginations, which, although exploring future forms of urban life, can also be understood as imaginations of the promisingly uncertain future of China.

NOTES

¹ The data comes from National Bureau of Statistics of China.

² In 2017, China's revenue from land sales reached 5.2 trillion yuan, accounting for 24.0% of local governments' overall financial resources. Eleven real estate-related tax revenues reached 2.5 trillion yuan, accounting for 11.4% of local comprehensive financial resources. In total, the real estate industry contributed 35.4% of local fiscal revenues.

³ Yingfang Chen, *City Chinese Logic* (Chinese Edition: 城市中国的逻辑), (Shanghai: Shanghai SDX Joint Publishing Company, 2012).

⁴ Matthew Soules, *Icebergs, Zombies, and the Ultra Thin: Architecture and Capitalism in the Twenty-First Century*, (New York: Princeton Architectural Press, 2021).

⁵ The State Council of The People's Republic of China, Decision of the Standing Committee of the National People's Congress on authorizing The State Council to carry out pilot real estate tax reform in some regions (Chinese: 全国人民代表大会常务委员会关于授权国务院在部分地区开展房地产税改革试点工作的决定), Available at: http://www.gov.cn/xinwen/2021-10/23/content_5644480.htm.

⁶ Tendentious housing shortages does not refer to a widespread housing shortage caused by inadequate housing construction, but to the housing shortage of specific groups, especially the low class in the urban area.

⁷ Henri Lefebvre, *The Production of Space*, trans. Mark Kammerbauer (Oxford; Cambridge, Mass.: Blackwell, 1991).

⁸ Faced with the great success achieved by Japan, South Korea, and other East Asian countries after the second world war, people summed up their modernization process as the "East Asian model". After achieving outstanding economic achievements, these countries have also encountered similar social problems. In the 1990s, Japan experienced the collapse of the real estate bubble. After the housing price peaked in history, the destruction of real estate led to the collapse of financial markets. Japan's economy fell into a long-term slump, also called the lost decade (Japanese: 失われた10年).

⁹ It is also worth noting that there are also considerable differences between modern Japan and China in housing systems, ideology and even ownership rights. For example, in Japan, buyers hold the title to land in perpetuity, while in China, land always belongs to the state due to the law, and buyers generally only own the house and have 70 years' right to use the land.

¹⁰ Claudia Hildner, *Small Houses: Contemporary Japanese Dwellings*, (Basel: Birkhäuser GmbH Basel, 2011).

¹¹ Yoshiharu Tsukamoto, *Tokyo Metabolism, Escaping the Spiral of Intolerance: Fourth-Generation Houses and Void Metabolism*.

¹² Koh Kitayama, Yoshiharu Tsukamoto and Ryue Nishizawa, *Tokyo Metabolizing*, (Tokyo: TOTO, 2010).

¹³ According to data provided by Tokyo government, Tokyo's land is now shared by 1.8 million landowners, including 1.7 million individual landowners and 100,000 corporate landowners.

¹⁴ Ho Cheuk-Yuet, *Neo-socialist Property Rights: the Predicament of Housing Ownership in China*, (Lanham, Maryland: Lexington Books, 2015).

¹⁵ Chen Yang, *From Model Community to Monumental Site: a Workers' Village through History*. (Shanghai: Tongji University Press, 2019).

¹⁶ Dingzeng Wang, *Planning and Design of Shanghai Caoyang New Village Residential Area*, (1956).

¹⁷ Guijie Din, *The New Estate for Workers: "Happy Life For Ever"*, (doctor thesis, Tongji University).

¹⁸ Dieter Hassenpflug, *the Urban Code of China*, trans. Mark Kammerbauer (Basel: Birkhäuser GmbH, 2010).

¹⁹ Duanfang Lu, *Remaking Chinese urban form: modernity, scarcity, and space, 1949-2005*, (London ; New York: Routledge, 2006).

²⁰ Dieter Hassenpflug, *the Urban Code of China*, trans. Mark Kammerbauer (Basel: Birkhäuser GmbH, 2010).

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TOWARDS INCLUSIVE LIVING: AN INTERDISCIPLINARY APPROACH TO COMMUNITY-SUPPORTED ECOSYSTEMS IN PUBLIC HOUSING

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INTRODUCTION

In the contemporary Australian housing landscape, social housing is a crucial part of the social safety net but faces significant challenges and negative perceptions. It is essential for providing stable, long-term housing solutions for low-income individuals or those with complex needs, yet it is often viewed as exacerbating social and economic disadvantages.¹

This paper introduces an interdisciplinary design project planned for the second half of 2024, aimed at addressing these challenges by creating community-supported ecosystems within public housing developments. The initiative involves academia, design professionals, tenants, and state government agencies to enhance social inclusion and foster a sense of belonging among residents. By employing participatory design methodologies, the project empowers tenants to co-create their living environments, incorporating their perspectives and preferences.

Through workshops, focus groups, and collaborative design sessions, tenants will share insights into their experiences and aspirations, enriching the design process and resulting in solutions that address both physical and social dimensions of public housing. The project aims to create cohesive and supportive living environments that prioritise residents' well-being and empowerment, challenging the negative perceptions of social housing in Australia.

This approach contrasts with prevailing negative views that stigmatise residents and contribute to feelings of shame. By fostering collaboration between academia and real-world challenges, the project serves as a model for building vibrant, resilient communities within public housing. The interdisciplinary approach highlights the importance of holistic and inclusive design principles in addressing complex social issues.²

Additionally, this paper illustrates the transformative potential of design-led efforts in catalysing positive social change, supported by state government agencies. This aligns with efforts like the National Housing and Homelessness Agreement, which aims to improve access to secure and affordable housing. The project will also provide a toolkit to support advocacy for funding initiatives to improve public housing tenants' experiences. This toolkit will be a valuable resource for stakeholders seeking financial support for projects that enhance the quality of life and social outcomes in public housing, contributing to ongoing community development and social welfare discourse.³

The Brief History and Current Crisis of Social Housing in Australia

Social housing consists of two main types: public housing, which is owned and managed by State and Territory Governments, and community housing, which is managed and often owned by not-for-profit organisations. Public housing in Australia has a long history dating back to the early 20th century, with major developments occurring after World War II. The 1945 Commonwealth-State Housing Agreement established a framework for federal and state governments to jointly fund and manage public housing initiatives. This led to a boom in public housing construction during the 1950s and 1960s, creating large housing estates in urban areas.⁴

However, the landscape began to shift in the 1970s and 1980s as economic pressures and changing political ideologies led to reduced government investment in public housing. The focus moved towards encouraging private home ownership and market-based solutions to housing affordability.⁵

This trend has continued, resulting in a significant decline in social housing. In 1981, 4.9% of Australian households lived in social housing, but by 2021 this had dropped to just 3.8%. This puts Australia behind comparable countries like England, where 17% of households live in social housing.⁶

	Social housing dwellings	All Australian dwellings	% Social Housing
<u>1981</u>	228,938 dwellings	4,668,906 dwellings	4.9%
<u>2021</u>	351,017	9,275,217 households	3.8%

Figure 1. Sources: AHURI Final Report No. 231 and ABS.

Today, Australia faces a critical shortage of affordable housing. The 2021 Census recorded 348,018 social housing dwellings, while over 216,000 applicants were on waiting lists. In total, about 6.1% of households were either in or seeking social housing—a significant gap from the 3.8% currently.⁷

The composition of social housing has also shifted over time. As of June 2023, there were around 446,000 social housing dwellings in Australia:

- 67% (298,000) were public housing
- 26% (114,000) were community housing
- 3.1% (14,000) were state-owned and managed Indigenous housing
- 4.3% (19,000) were Indigenous community housing.⁸

While community housing stock has increased since 2006, public housing stock has declined. This reflects a move towards privatisation and community housing models. The shortage of affordable housing is exacerbated by rising living costs and stagnant wage growth. High inflation, rising interest rates, and increasing rents have put unprecedented pressure on low and middle-income households.⁹



Figure 2. Public Housing in Flemingington, Melbourne. Source: ABC

The Growing Demand for Public Housing

The demand for public housing in Australia is growing significantly, with approximately 189,000 households on social housing waiting lists as of December 2023.¹⁰ This represents a substantial increase from the 166,000 households reported in June 2020, with nearly 40% classified as being in 'greatest need'. These figures underscore the urgent need for affordable housing solutions, particularly for vulnerable populations such as those at risk of homelessness or fleeing domestic violence.¹¹

Despite the increasing demand, the proportion of social housing in Australia has steadily declined over the past few decades, as illustrated by the data. This decline has occurred alongside a sharp increase in government spending on Commonwealth Rent Assistance (CRA), which rose from approximately \$3 billion in 2007-08 to over \$5.3 billion in 2020-2.¹² However, the increased spending on CRA has not adequately addressed the housing affordability crisis. The maximum weekly CRA payment remains capped at \$73, and inadequate indexing has failed to keep pace with rising rents.¹³ Consequently, rental stress has become more prevalent, with nearly half (46 per cent) of households receiving CRA experiencing rental stress, defined as spending more than 30 per cent of household income on rent.¹⁴

Australia's focus on promoting home ownership while neglecting social housing expansion has created a "lose-lose" situation. The lack of a coherent national housing policy has contributed to this crisis, leaving many vulnerable Australians struggling to find stable, affordable accommodation. There is an urgent need for a comprehensive, long-term strategy to address Australia's housing crisis. This should include significant investment in new social housing stock, renovation of existing public housing, partnerships with community housing providers, incentives for private sector investment in affordable housing, and a national framework for inclusionary zoning.¹⁵

As Australia grapples with economic uncertainty, providing adequate social housing is more critical than ever. A paradigm shift in housing policy is needed—one that recognises housing as a fundamental right and prioritises creating diverse, affordable housing options for all Australians. This approach should address both the supply of affordable housing and the adequacy of rental assistance programs to ensure a more equitable and sustainable housing landscape for the future.

Satisfaction levels of Public Housing

A 2023 National Social Housing Survey by the Australian Institute of Health and Welfare indicates that just over 70 per cent of tenants were satisfied with emergency maintenance services but expressed dissatisfaction with improvements to the building and surroundings.¹⁶ Nevertheless, tenants highlighted several benefits of living in public housing, such as better economic management, a sense of

community, and an increased ability to cope with life's events. Despite these advantages, tenants stressed significant challenges associated with public housing. These include the stigmatisation resulting from the concentration of lower socio-economic groups in specific areas and a persistent lack of investment in renovations. The limited opportunities for improvement projects in and around the buildings often lead to a diminished sense of home and community pride among residents. This underinvestment not only affects the physical living conditions but also impacts the tenants' overall well-being and their ability to feel truly settled in their living spaces.¹⁷

The inadequate supply of social housing is further compounded by significant maintenance and repair costs. Over the past five years, nearly \$34 million has been spent repairing Queensland public housing due to vandalism, damage, and uncleanliness.¹⁸ This highlights a broader issue within the public housing system - the substantial financial burden it places on taxpayers. Public housing is primarily funded through taxpayer dollars, and critics argue that these funds could be more effectively allocated to other programs. The costs associated with social housing support can be substantial, often reaching billions of dollars annually, making public housing a significant social expense.¹⁹

CO-DESIGN/DESIGN THINKING AS A PRIMARY METHODOLOGY

Co-design or participatory design and design thinking methodologies have emerged as transformative approaches in addressing complex societal challenges, particularly in public and third sector projects like social housing. These human-centered approaches prioritise empathy, intuition, and inspiration over purely analytical or functional considerations.²⁰ They involve diverse stakeholders, fostering innovation through the synthesis of varied perspectives and positioning participants as active change-makers rather than passive recipients of solutions. The process typically follows a structure that includes exploration, creation, and prototyping phases.²¹

1. Exploration/Discovery Phase: This stage involves empathising with stakeholders, conducting research, and defining their needs and aspirations. For the public housing project, immersive workshops with public housing tenants will be conducted to understand their lived experiences, challenges, and aspirations. Participatory mapping exercises and storytelling techniques will capture rich, qualitative data about tenants' daily lives and interactions with their living environments.²²

2. Creation/Ideation Phase: Participants will engage in brainstorming, ideation, envisioning, and narrating potential solutions. In the public housing context, collaborative design sessions will bring together tenants, housing professionals, and policymakers. Using design thinking tools such as persona creation and journey mapping, participants generated and refined ideas for improving social housing.

3. Prototyping and Testing Phase: This will involve building and testing tangible representations of the proposed solutions. For the public housing project, innovative ideas will be developed into tangible prototypes, ranging from physical models to manual and digital concepts. Tenants will be actively involved in testing and providing feedback on these prototypes, allowing for rapid feedback and refinement of ideas.

Throughout the process and in addition to in person workshops, digital collaboration platforms will facilitate ongoing communication and idea-sharing among participants. This iterative approach will allow for continuous refinement of concepts and ensured that tenants' voices remained central to the design process. By following this human-centered approach, co-design and design thinking methodologies aim to produce more innovative and effective solutions that resonate with the intended users and stakeholders, ultimately leading to improved public housing project outcomes.²³



Figure 4. Project Site, Spring Hill, Brisbane. Source: Author

The characteristics of the study's participants were largely similar to the tenant profile of the community housing provider, though there was a higher representation of females and older individuals in the study compared to the overall tenant population. These participant demographics align with typical Australian social housing tenants, where 62% are female, 55% are single adult households, and 73% are aged 45 years or older.²⁵

The housing complex in Spring Hill, Brisbane, is managed by Fortitude Valley Housing, a housing service centre of the Queensland Government. Long-term tenants have experienced challenges including break-ins, vandalism, and drug-related issues involving a few tenants and neighbours. Despite these difficulties, the residents are eager to personalise and improve their living environment. To address these concerns and empower the tenants, a participatory design process will be implemented. This co-design approach will bring together the tenants, Fortitude Valley Housing representatives, LiveSpace, and an Urban Design Studio to collaboratively develop solutions. The design process will be structured into six key meetings, ensuring that all stakeholders have a voice in shaping the improvements and fostering a sense of ownership and community among the residents.

1. Meeting 1: Define Goals and Objectives

This initial session focused on establishing the project's aims and desired outcomes, ensuring all stakeholders had a shared understanding of the project's purpose.

2. Meeting 2: Workshop - Brainstorming and Ideation

Participants engaged in creative exercises to generate a wide range of ideas for improving the housing complex, addressing security concerns, and enhancing the overall living experience.

3. Meetings 3 and 4: Workshops - Creating Tangible Representations

These sessions involved transforming the ideas generated during the co-design process into concrete representations. This included developing both low-fidelity prototypes (such as sketches and paper models) and high-fidelity prototypes (like digital mock-ups and functional models).

4. Meeting 5: Workshop - Feedback and Refinement

In this session, participants reviewed and provided feedback on the prototypes developed in the previous meetings. This allowed for further refinement of the designs and ensured that they continued to align with the needs and preferences of the tenants.

5. Meeting 6: Workshop - Implementation Planning

The final workshop focused on developing a concrete plan for implementing the chosen designs. This included discussing timelines, resource allocation, and assigning responsibilities to ensure a smooth transition from design to reality.

Throughout the process, digital collaboration platforms will facilitate ongoing communication and idea-sharing among participants. This approach will allow for continuous refinement of concepts and ensured that tenants' voices remained central to the design process. The co-design methodology will ensure that the outcomes are not only theoretically sound but also practically applicable and responsive to the real needs of the community. This aligns with the growing recognition of co-design's potential to address systemic issues and improve life conditions for specific demographic groups.²⁶

The Toolkit

In addition to addressing design responses for the pilot project site, this project aims to provide a comprehensive design concepts toolkit. The toolkit is designed to suggest improvements for existing public housing buildings, focusing on enhancing living conditions through practical guidance on improving, but not limited to, communal spaces. It covers essential aspects such as setting goals, budgeting, and design considerations.

This toolkit will be instrumental in seeking funding from housing corporations to improve these spaces. It empowers tenants to actively participate in enhancing their living environments and serves as a platform for sharing innovative ideas that can transform communal areas and foster community engagement.

The guide begins by helping residents establish clear objectives for their living space improvements, ensuring that efforts align with personal needs and community standards. Budgeting tools are included to assist tenants in managing financial resources effectively, ensuring that improvements are both affordable and sustainable.

By offering a holistic approach to home improvement, the toolkit not only aims to improve livability in public housing buildings but also to inspire collaboration and strengthen community ties. It is a valuable resource for fostering sustainable and supportive housing communities, ultimately benefiting the broader public housing community by enhancing the quality of life for all residents.



Figure 5. Early Ideation Sketch. Source: Author

CONCLUSION

In conclusion, this interdisciplinary project represents a significant step towards addressing the complex challenges facing Australia's social housing sector. By bringing together academia, design professionals, tenants, and state government agencies, this initiative offers a promising approach to encouraging community-supported ecosystems within public housing developments.

The project's focus on participatory design methodologies, particularly co-design and design thinking, marks a departure from traditional top-down approaches to public housing management. By empowering tenants to actively co-create their living environments, the project not only gives voice to their perspectives and preferences but also fosters a sense of ownership and community pride. This approach has the potential to address many of the issues highlighted in the National Social Housing Survey, including dissatisfaction with building improvements and the stigmatisation often associated with public housing.

The collaboration between LiveSpace Studio, the tenants, Fortitude Valley Housing, and other stakeholders demonstrates the power of interdisciplinary partnerships in tackling complex social issues. By leveraging the expertise of design students and professionals, housing professionals, and policymakers, the project creates a rich environment for innovation and problem-solving. The structured design process, with its six key meetings, ensures a comprehensive approach that covers everything from goal-setting to implementation planning.

Moreover, the project's emphasis on creating both physical and social solutions addresses the multifaceted nature of the challenges facing public housing in Australia. By considering not just the built environment but also the social dynamics within the housing complex, the project has the potential to create truly cohesive and supportive living environments.

The development of a comprehensive design toolkit to support advocacy efforts is particularly significant. This resource could prove invaluable in securing funding for future initiatives aimed at improving the lived experiences of public housing tenants. By providing stakeholders with best practices and advocacy tools, the project contributes to the broader effort of establishing inclusive and sustainable living environments within public housing contexts.

However, while this project represents a significant step towards reimagining public housing in Australia, it's important to acknowledge the broader context in which this project operates. The declining proportion of social housing in Australia, coupled with increasing demand and rising costs, presents significant challenges. While this project offers a promising model for improving existing public housing, it also highlights the need for a comprehensive, long-term strategy to address Australia's housing crisis at a national level.

As Australia grapples with its housing affordability crisis, initiatives like this one provide hope for a more equitable and sustainable housing landscape in the future. The success of this project could pave the way for a paradigm shift in housing policy, one that recognises housing as a fundamental right and prioritises creating diverse, affordable housing options for all Australians.

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DOWNTOWN DENVER AND THE PARADOXICALITY OF THE MID-TWENTIETH CENTURY AMERICAN VISION ON URBAN RENEWAL

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INTRODUCTION

The current Homelessness crisis in Downtown Denver reveals a type of societal short-sightedness which begs for a series of serious questions. While there were various causes which led to this pathology, among the most acute ones was the dramatic shift of the site following its early 1980s urban renewal. As part of a greater neoliberal vision on eradicating the blight from cities' centers—*The Skyline Urban Renewal Project* aimed at reimagining the Denver's Downtown area as lavish, high, rapid, but most importantly: Sleaze-Free!

In their 1999 pioneering volume, 'Braving the Street: The Anthropology of Homelessness', Irene Glasser and Rae Bridgman point out that the emergence of Homelessness as a national public concern in the United States occurred during the late 1970s and early 1980s.¹ The causal relation between the drastic transformation of the face and fabric of American cities and the intensification of homelessness in cities' centers, not only contextualizes this phenomenon within the societal realm, but also reveals that the other side of urban livability—as manifested within the mid-twentieth century's American vision on Urban Renewal—was the dying of the (other) city dwellers. This paper explores the relations between the 1980s *Skyline Urban Renewal Project*, and the current Homeless crisis in Downtown Denver as a symptom of a paradoxical American Dream on Livable City.

THE ENABLERS: FEDERAL ACTS AT THE AGENCY OF COLLECTIVE IMAGINATION

For a large extent, the future nature of urban renewal in US cities was shaped between 1949 and 1956. Within a seven-year period, two substantial federal acts forever changed the social and urban fabric in America. The first was the *1949 Housing Act*; the second was the *Federal-Aid Highway Act of 1956*. The latter resulted from a simultaneous national aspiration on security and speed; the former came in response to the decline of cities' centers. Their interplay, however, provides a unique glimpse into the post-World War II American sentiment, which consisted of both megalomania and melancholy. In the context of Denver's Downtown, this paper asks: "What kind of urban public space was shaped by those national collective sentiments? And then, what is the relation between a public space that was shaped by these sentiments, and the return of the homeless to Denver's Downtown by the twenty-first century?"

1949 Housing Act

The first, and main, instigator for the intensity of urban renewal projects in the US during the second half of the twentieth century was the passing of the *1949 American Housing Act*. The act intended to address the decline of urban housing in cities' centers that followed postwar demographic changes, and the consequent mass migration towards the suburbs.² It was the first "direct federal involvement in physically shaping cities".³ Subsequent to the social logic, as enacted via the *1939 New Deal*, the *1949 Housing Act* reflects a desire for political attention to urban conditions.⁴ The legislation dealt specifically with these three areas: reduction of housing costs; establishing and improving housing standards and standardization; and the clearance and rebuilding of slums⁵ and blighted areas.⁶ This latter point deserves close attention. Aiming at combating social blight as part of housing legislation marked a paradigmatic shift, not only in the scale of federal intervention within urban policies, but also—and more importantly—because of its ideological nature.

The term "blight" is a legal term used for the purpose of determining whether a neighborhood or commercial area can qualify for urban renewal.⁷ Describing the federal fiscal mechanism to foster clearance and rebuilding "Blighted areas", established under Title I of the *1949 Housing Act*, social historian Colin Gordon writes: *local redevelopment corporations could buy and clear blighted areas with federal money, sell the land to private developers, and use the proceeds to cover the redevelopment costs.*⁸ While the Act's first title is prescriptive in regard to the newly proposed fiscal mechanism, the usage of the term "blight" to designate sites for clearance remains deliberately vague.⁹ Inherently subjective—or even metaphorical (as it originated as a description of the biological condition of the decaying of plants)—the usage of the term "blight" for legal purposes, renders dubious the neutrality of its application. Delineating the legal roots of the term, Gordon writes: *The modern statutory definition of blight is rooted in our first urban crisis, the Progressive-era response to the urbanization and industrialization in the late nineteenth and early twentieth century.*¹⁰ More importantly, however, is the fact that from the outset, "blight" as a legal term was associated not only with crime and decay, but also with a social fear of homelessness. According to Gordon:

Cities, in the environmental determinism of urban reformers, had become "nurseries of crime, and of the vices and disorderly courses which lead to crime perpetrated by individuals who have either lost connection with home life, or never had any, or whose homes had ceased to be sufficiently separate, decent, and desirable to afford what are regarded as ordinary wholesome influences of home and family...".¹¹

This origin link between blight and homelessness—given the function of the term in designating areas for urban clearance (and renewal)—casts a further light on the set of criteria and considerations that underlie the procedure of sites' selection. If part of the decision to demolish a site was affected by the fact that it was occupied by homeless people, what does it say about those who chose to exclude them? What system of belief is threatened by being home-less?

The scope of the federal urban renewal projects that were established under Title I of the *1949 Housing Act* during 1954 and 1974—those programs which per Fainstein: *became the principal weapon used by government to combat urban "blight"*¹²—suggest that the desire to eliminate the homeless is simply a symptom for the protection of the dogmatic—perhaps neurotic—practice of family. However, even though the act's first title marked blighted areas as "predominantly residential," neither cities nor developers were required to build affordable housing on their redeveloped districts.¹³ This gap between the stated social goal and its actual implementation testifies to the intricacy of the overt and covert collective desires: first, the impulse to clear out the streets from the presence of the homeless demonstrates the pivotal role of the American taboo called: 'family', and then, the paradoxical absence of residential constructions within the renewal sites themselves, reveals that the American worship of

commerce is even more ecstatic than the one associated with family. Was that not precisely the void through which the homeless person would later be finding their way back?

Federal-Aid Highway Act Of 1956

The second profound influencer of the late twentieth century American vision on urban renewal was *The National Interstate and Defense Highways Act of 1956*, aka the *Federal-Aid Highway Act of 1956*. This act established the biggest public project in the nation's history.¹⁴ Seeds for this project were already planted during the 1930s, but it took over two decades to transform vision into legislation, and it was under President Dwight D. Eisenhower that the act was fully implemented. For a large extent, Eisenhower's vision on highways and their role in national defense was inspired by the German highway network.¹⁵ Observing its function in defending Germany during World War II, Eisenhower was driven to build a matching roads system that would position America at the cutting edge of mobility and security. In this sense, the Interstate Highway project was a vision of modernity that is linked not only to speed, but also to military power.

An attempt to disguise the desire for gaining greater national power through the implementation of the Interstate Highway System can be seen in the shifting of the Act's title from *The National Interstate and Defense Highways Act* to *The Federal-Aid Highway Act*. The replacement of the word "Defense" by the word "Aid" alludes to the camouflaging of a national desire for a militant power by an innocuous communal sentiment. In fact, the construction of the Interstate Highway System drastically altered the community development in America during the late twentieth century. As part of this project, massive superhighways cut through neighborhoods, and countless households were displaced.¹⁶ Most of the displaced households belonged to poorer and disadvantaged communities.¹⁷ Discussing the impacts of the *Highway Act of 1956*, in her introduction to *Restructuring the City: The Political Economy of Urban Redevelopment*, Susan Fainstein writes:

The Highway Act of 1956, establishing the interstate expressway system, marked the beginning of large-scale federal intervention in urban road systems. ...Federal intervention greatly increased the tempo of road building and for the first time put priority on urban, as opposed to rural, highways. The federal intrusion, however, did nothing to reorient the preexisting focus on improving traffic flow to the detriment of other considerations such as community preservation...¹⁸

The current Downtown Denver area is a perfect example for the implications of the disconnect between the grandiose national modern vision on speed—linked to military power—linked to wealth—and the societal local demands for housing. Intrinsic to this disconnect is the site's regional setting. First, its geography, then its political pulls, created an urban phenomenon which was shaped by a national vision on urban renewal at a metropolitan—rather than social—scale. Geographically speaking, Denver's Downtown functions as a regional node at the intersection of the I-25—an Interstate Highway that runs from north to south and the I-70—an above lateral Interstate Highway that runs from east to west. Both were completed in 1958 and expanded during 1964, as part of the *Federal-Aid Highway Act of 1956*.¹⁹ By the mid-twentieth century, not only its geography, but also its socio-economic fabric, gained Denver its regional function, power, and image. For a large extent, it was the domination of military and federal programs that gave Denver its distinct social orientation—ultimately affecting the future vision on a public space that is attuned to those forces. In his 1983 essay, *From Cowtown to Sunbelt City: Boosterism and Economic Growth in Denver*, historian Dennis Judd lists the various array of military installations which were landed—or already existing—in, or very near, the Denver Metropolitan Area during the second half of the twentieth century: *The Air Force Academy*; *The U.S. Army Corps of Engineers*; *The Air Force Accounting and Finance Center*; along with *The Lowry Air Force Base and Buckley Naval Air Station*, as well as *The Fitzsimmons Army Hospital* that was expanded into a major regional medical facility.²⁰ Dominated by military industries and personnel, Denver's regional

supremacy was based on an economy that—according to Judd—was *intricately tied to the Cold War*.²¹ To what degree was the mid-twentieth century Denver’s economy affecting the type of vision which shaped its later urban renewal?

THE SKYLINE URBAN RENEWAL PROJECT

Prompted by both the *1949 Housing Act* and the *Federal-Aid Highway Act of 1956*, *The Skyline Urban Renewal Project*—which was proposed in 1963, executed during the 1970s, and completed in 1984—came in response to the postwar poor housing condition and decayed city’s center.²² Prior to its implementation, a massive eradication of twenty-seven urban blocks at the heart of Denver’s downtown was managed by the newly established Denver Urban Renewal Authority (DURA) that was formed in 1958, specifically for that mission²³ (Figures 1 and 2). According to *50 Years of Revitalizing Denver*—a municipal document produced in 2008 by the Denver Urban Renewal Authority, the organization was granted with: *The power to acquire blighted property, through condemnation, if necessary, relocate occupants of the property and affect its redevelopment*.²⁴

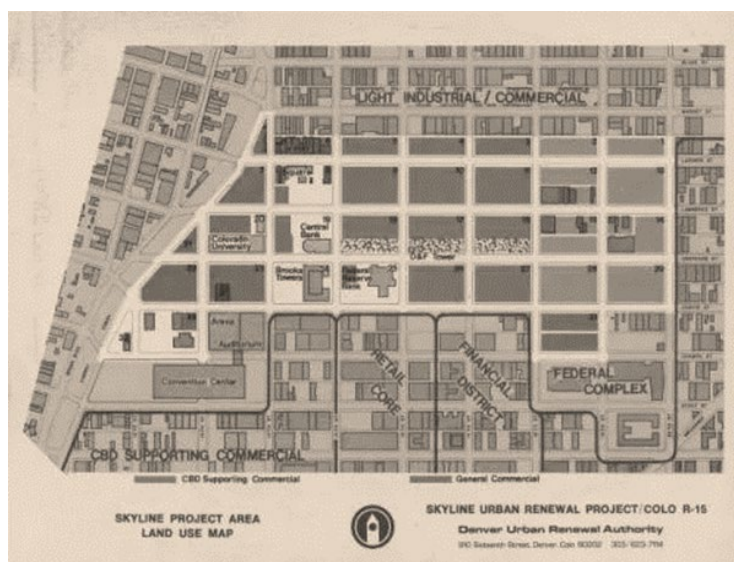


Figure 1. A map of anticipated land uses in the Skyline Urban Renewal Project (Denver Public Library)



Figure 2. An aerial view of Denver in 1976 approaching Stapleton Airport (Nick DeWolf/Courtesy the Nick DeWolf Foundation)

The realization of the project was the result of many years of negotiation between the public and the private sectors.²⁵ It began with the initiation of the *Downtown Denver Master Plan Committee* in 1961. The committee was comprised of both public administration and businessmen. By the end of 1963, the committee produced a set of proposed guidelines for the development of the *Downtown Denver Skyline Project*. Even though the original proposal was rejected by the public in 1964, a vote for the project passed in 1968 with overwhelming support, due to the shift in public opinion following the flood which hit the city three years earlier.²⁶ The redevelopment plan that stretched over one hundred and twenty acres (equal to the 27 erased blocks) aimed at creating a renewed city's center based on balanced residential and commercial spaces. Despite that declared vision, the project ended up transforming Denver's downtown into a symbolic image of corporate technology.²⁷

Moreover, prior to the implementation of the redevelopment plan, the site was the densest area of affordable housing within the city of Denver.²⁸ One could argue that the seeds for the current homelessness crisis in Denver's downtown were planted not only by the eradication of the dense housing structures, but also by the elimination of that program from public sight. Discussing the ratio between residential and commercial spaces within the *Skyline Urban Renewal Project*, historian Dennis Judd writes:

Redevelopment in the central business district has consisted largely of office space, commercial centers, and hotels. All of DURA's revitalization activities have been located either in the central business district or very close by with the exception of the residential redevelopment program ... The major redevelopment effort continues to be the city's core financial and economic center. The degree to which this commercial revitalization dwarfs DURA's efforts at residential revitalization can only be understood by comparing the dollar investments of the two...²⁹

According to Judd, *less than two percent of the private and public investment was committed to residential development*.³⁰ Citing the *Rocky Mountain News*, Judd notes that:

In 1979 there were only 794 housing units in the Skyline Project. Of these, 590 were subsidized for the elderly or low income ... By 1981, DURA planned to construct an additional 297 units for the elderly and physically disabled. Nearly all of the remaining several hundred housing units in the downtown are luxury condominiums.³¹

While the residential portion of the redevelopment was drastically reduced, at its completion, the project was comprised of five new constructions for public programs and a dozen new buildings for the private sector. Its public programs included: *the new police and fire buildings; a sports arena; libraries; and a giant complex for The Denver Centre for the Performing Arts*. The construction made for the private sector included: *The Mile High Centre; Petroleum Club; Denver Club; First National Bank; Hilton Hotel; Brown Palace West; May D & F; Security Life; Western Federal; Colorado State Bank; Lincoln Centre; Downtown Holiday Inn, and Denver Plaza Hotels*.³²

With the arrival of a massive amount of office towers and commercial spaces, the *Skyline Urban Renewal Project* dramatically transformed a relatively small area of only twenty-seven blocks in Denver downtown.³³ From a low-rise residential neighbourhood, the site was transformed into a vertical uniformed shining conglomerate, aimed at being viewed from the I-25 Highway as a lavish, dense, modern monumental urban object, which is iconic from the perspective of a car passenger—yet conspicuously blind to its native community.

THE SKYLINE PROJECT AS AN EPITOME OF THE NATIONAL PARADOXICAL VISION ON LAVISH / (LIVABLE) CITY

Seeds for the paradoxicality of the modern American vision on urban renewal were already planted during the late nineteenth century with the birth of "blight" as a legal term in urban planning. The origin of its usage in designating social danger in relation to individuals who retain no connection with homelife marks the intersection between modern moral concerns and spatial practices. Approximately five decades later, under Title I of the *1949 Housing Act*, the term had been used to qualify urban clearance. This radical shift between the passive designation of dangerous urban sites (in relation to homelessness), and the active order to demolish them, testifies to the level of intensified societal aggression in post-World War II America.

Similarly to the practice of urban clearance, as exercised via the *1949 Housing Act*, the massive nationwide housing demolitions exercised via the *Highway Act of 1956*, were yet another manifestation of societal aggression produced by modern ideology. As an expression of the national desire for speed linked to military power, The National Interstate Highways System epitomizes the duality between the fascination with modernity and the aggression it produced. *The Skyline Urban Renewal Project*—the redevelopment project for Denver's Downtown that emerged following these two federal acts and included both massive urban clearance and a housing demolition for the sake of hosting an Interstate Highway, is a perfect example of a production of modern dichotomy of livelihood and destruction.

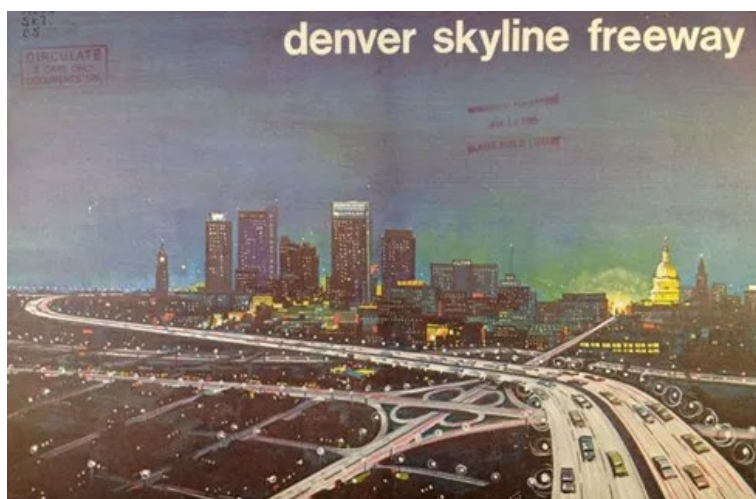


Figure 3. Image of the Unbuilt Skyline Freeway, 1967 (Denver Public Library) (Denver Public Library)

A marketing image of the project (Figure 3) that was produced in 1967, to sell a vision of its free highway, encapsulates the paradoxicality of the modern American dream on urban renewal as an agency for a simultaneous lavish and livable city. A close observation of the image in relation to the current reality of the site testifies to the gap between the virtual and the actual Denver downtown. The conglomerate of extravagant towers, which replaced what once used to be a dense housing hub, and today serves as a condensed cluster of office towers that provides a backdrop for countless street dwellers, reveals that the project's appearance as viewed from the highway was one of the most acute driving forces. Tangent to the peak of the I-25 curve, the site's visibility from the Interstate Highway at the speed of a car—and its potential iconic presence within the regional setting—played a crucial role in the re-imagining of Denver Downtown. This domination of the image over space—of the appearance of the city over its spatial experience—provides a partial explanation for the level of social neglect as is evidenced via the current homeless crisis.

The other part is more abstract. If *The Skyline Urban Renewal Project* was a product of a modern vision on wealth linked to speed—linked to military power, its clearance and demolition could be read as the turning of the desire for a militant force inward. Moreover, in an economic climate which retained heavy

reliance on the literal Cold War, the elimination of the residential component from the renewal project could be observed as yet another practice of the Cold War—only this time it was a metaphorical one. It was an undeclared war of capital forces and giant corporations on the poor, the disenfranchised, and the disadvantaged subject who, in turn, returned to occupy the City Center twenty years later, only to remind it of its social blindness.

NOTES

¹ Irene Glasser and Rae Bridgman. *Braving the Street: The Anthropology of Homelessness* (New York-Oxford. Berghahn Books, 1999), 1.

² “2014 National Planning Excellence Awards: Planning Landmark Housing Act of 1949” American Planning Association, accessed August 8, 2024, <https://www.planning.org/awards/2014/1949housingact.htm>

³ Robert E. Lang and Rebecca R. Sohmer. 2000. *Legacy of the Housing Act of 1949: The Past, Present, and Future of Federal Housing and Urban Policy*, 11:2, 291-298, DOI:10.1080/10511482.2000.9521369.

⁴ Colin Gordon, “Blighting the Way: Urban Renewal, Economic Development, and the Elusive Definition of Blight,” *Fordham Urban Law Journal* 31, no. 2 (2004): 310.

⁵ Robert M. Fogelson. *Downtown: Its Rise and Fall, 1880-1950* (Yale University Press. New Haven and London. 2001), 389.

⁶ “2014 National Planning Excellence Awards: Planning Landmark Housing Act of 1949” American Planning Association, accessed August 8, 2024, <https://www.planning.org/awards/2014/1949housingact.htm>

⁷ Gordon, *Blighting the Way*, 306.

⁸ Gordon, 311.

⁹ Gordon, 305.

¹⁰ Gordon, 311.

¹¹ Gordon, 308.

¹² Susan Fainstein. *Restructuring the City: The Political Economy of Urban Redevelopment*. (New York: Longman, 1983), 16

¹³ Colin Gordon, “Blighting the Way: Urban Renewal, Economic Development, and the Elusive Definition of Blight,” *Fordham Urban Law Journal* 31, no. 2 (2004): 316.

¹⁴ “National Interstate and Defense Highways Act (1956)” Milestone Documents, accessed August 8, 2024, <https://www.archives.gov/milestone-documents/national-interstate-and-defense-highways-act>

¹⁵ “National Interstate and Defense Highways Act (1956)” Milestone Documents, accessed August 8, 2024, <https://www.archives.gov/milestone-documents/national-interstate-and-defense-highways-act>

¹⁶ Fainstein, *Restructuring the City*, 14.

¹⁷ Fainstein, 14.

¹⁸ Fainstein, 14.

¹⁹“Historic Timeline“, Colorado Department of Transportation, accessed August 8, 2024 <https://www.codot.gov/about/CDOHHistory/centennial/timeline>

²⁰ Dennis Judd. “From Cowtown to Sunbelt City: Boosterism and Economic Growth in Denver”, In *Restructuring the City: The Political Economy of Urban Redevelopment*, ed. Susan S. Fainstein et al. (New York-London. Longman, 1983), 172.

²¹ Judd, 172.

²² Judd, 179-182.

²³ Judd, 179.

²⁴ Denver Urban Renewal Authority, *50 Years of Revitalizing Denver* (Denver: 2008), 8.

²⁵ Judd, *From Cowtown*, 178-181.

²⁶Judd, 180.

²⁷ Judd,186.

²⁸ “Skyline and Auraria History: An Untold Story of Urban Renewal: Displacement, Gentrification and Wasteful Government Spending”, accessed August 8, 2024, <https://skylineandauraria.wordpress.com/>

²⁹ Judd, *From Cowtown*, 181.

³⁰ Judd, 182.

³¹ Judd, 182.

³² Judd, 180.

³³. “The Hole in the Heart of the City: The Story of Denver’s Urban Renewal”, accessed August 8, 2024, <https://medium.com/@alfredoluiscalvo>.

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NAVIGATING THROUGH THE MINEFIELD OF CONCEPTUAL URBAN HEALTH APPROACHES IN THE ERA OF COMPLEXITY AND PLANETARY HEALTH

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INTRODUCTION

In recent years, the need to approach health within the urban environment using complex systems and ecological thinking has come to the fore. This area is quickly gaining momentum and attention as a response to the challenge of creating healthy, resilient and sustainable urban environments. At the heart of this thinking lies the need to visualise/conceptualise how parts relevant to health and urban environments (as complex systems) interconnect using conceptual approaches, such as models, frameworks and maps. A plethora of conceptual approaches have developed over the years to help advance knowledge for research and practice concerning policy, intervention, assessment or general understanding. However, there is lack of a rigorous conceptual taxonomy of such approaches which is attributed to a general venturing by professionals and researchers across multiple disciplines. This paper maps the terrain of different conceptual approaches applied in research. In this context, it lays out three key streams that progressively advanced our understanding of such connections: early public health models, healthy cities and settlement approaches, and practice-oriented approaches. With such mapping of approaches, researchers and those involved in conducting healthy urban environments research would become better informed and educated about the conceptual anchoring to such commonly cited and used approaches as we navigate this era of complexity and planetary health.

EARLY PUBLIC HEALTH MODELS

Early public health models were instrumental in guiding subsequent approaches to urban health. These models moved beyond medical models and biomedical views of health that focussed solely on individualistic, human biology, and lifestyle factors. Prominent examples that highlighted the importance of examining factors beyond biomedical models included the Mandela of Health model by Hancock¹ and his subsequent ecological models, the model of the determinants of health by Dahlgren and Whitehead,² and the framework by Evans and Stoddart.³ These approaches stress the need to consider equity, inclusion, ecological principles, and the structural, material and social barriers to health.

Hancock's Mandela of Health model is described as ecologic.⁴ It explains public health using a "*complex, holistic, interactive, hierarchic systems view*".⁵ It distinctly separates the biosphere (environment) from society and culture as broader health influencers.⁶ This model integrates the natural and social sciences with two fundamental principles of ecological stability and social justice.⁷ Hancock

thought of health as dependent on a stable and safe ecosystem and social justice where wealth and access to healthcare are equitably distributed with complete protection of vulnerable and disadvantaged groups against exploitation at the expense of their health.⁸ Therefore, it explicitly addresses factors related to ecological thinking, equity and inclusion alongside lifestyle, human behaviour, human biology, psycho-socio-economic environment, and physical environment.⁹ Hancock described the biosphere as the “ultimate determinant of health”, where people are a small and interdependent part, asserting that it is a model of the human ecosystem¹⁰ consistent with the human ecology field and perspective. Ultimately, health revolves around humans,¹¹ and nature is seen as another influencer on human health.¹²

Dahlgren and Whitehead’s model of the determinants of health also focuses on addressing structural, social, and material conditions that cause health inequity demonstrated through relationships between layers of determinants.¹³ It generally aligns and builds on the theoretical concepts behind the WHO Commission on the Social Determinants of Health (SDOH) and its contemporary social epidemiology theories.¹⁴ According to researchers, the model is human-centred, where people, their age, sex, and hereditary factors are seen as influenced by layers of determinants and conditions considered threatening, promoting or protecting health in a rainbow-shaped diagram.¹⁵ The rainbow layout with layers of determinants was explicitly designed to create policy targets and intervention points to help address the social inequities¹⁶ with less focus on how these factors combine, overlap or amplify.¹⁷

HEALTHY CITIES AND SETTLEMENT APPROACHES

Public health and built environment researchers appear to have shifted their focus to creating healthy cities and settlements using frameworks and models that targeted urban planning and health promotion within cities. The multilevel, multi-dimensional framework for planning healthy cities by Northridge et al. is a prominent example that builds on the determinants of health approaches discussed earlier.¹⁸ The built environment is linked with the social, political, economic, and historical processes that create the built environment, ultimately affecting health and wellbeing.¹⁹ The framework by Northridge and colleagues is distinct in identifying variables that affect health and wellbeing in causal chains on different fundamental, intermediate, and individualistic built environment scales.²⁰ According to its authors, the built environment is the central focus of this framework and its policy orientation, while the natural environment sits in the background.²¹ The authors also discussed the need to integrate the concepts in their approach with contemporary social epidemiology frameworks based on social-ecological approaches to health and other approaches related to sustainable production, human rights in health, and life-course approaches.²²

The health map for the human habitat by Barton and Grant²³ and the subsequently refined versions,²⁴ including the Settlement Health Map,²⁵ attempted to bridge the knowledge gap in health and wellbeing by professionals involved in urban planning of human settlements. The layout of the original health map (developed in 2006) was inspired by the rainbow-shaped layers of determinants as posited by Dahlgren and Whitehead.²⁶ However, Barton and Grant saw the need to integrate systems theory, planning ecosystem theories, and the principles of sustainable development—especially the social dimension, within their maps.²⁷ In a later version (the Settlement Health Map), Barton added further links with Hancock’s Mandela of health, specifically in the way it connects health and human ecosystems.²⁸ Human settlements are also viewed as dependent on the surrounding global context and environment, specifically climate stability, biodiversity, and resource conservation.²⁹

The conceptual framework by Galea and colleagues³⁰ and de Leeuw’s theory-driven conceptual model called the healthy city meta-theory³¹ are further examples of mappings targeting health in cities. Both draw heavily on city-level policies and governance measures to shape health within cities. The two approaches acknowledged the complexity of cities and the social and institutional influences on

population health. Health is perceived as an outcome without further systematisation of interrelationships.³² De Leeuw analogised the city as a complex system—a living system partly considered an organism and partly an ecosystem.³³ Their theory purports that the city should be capable of adapting, repairing itself, coping with change, and fixing itself as an organism. Further, an ecosystem has a mixture of competing and cooperating systems of living and non-living organisms within its environment encompassing physical, cultural, and biological dimensions.³⁴ Therefore, the strengths of any city are based on its diversity, interdependence, efficiency in energy use and recycling of material capabilities.³⁵

Another approach by Glouberman et al. critically evaluated how health was being conceptualised in cities.³⁶ They argued that, on the one hand, approaches to urban health focused on addressing certain diseases or environmental problems within an urban context, such as water quality and housing conditions.³⁷ On the other hand, approaches related to healthy cities downplayed specific important issues and vulnerable population groups and ignored the cities' medical and other healthcare assets.³⁸ While Glouberman et al.'s approach in the way they looked at cities, human health, and health in cities is based on a complex adaptive systems perspective.³⁹ As complex adaptive systems, cities are conceptualised as a network of links and interactions where changes in one part may lead to consequences often unforeseen in another.⁴⁰ Similarly, health is also considered a complex adaptive system, a *“function of the complex nonlinear interaction of many forces”*.⁴¹

The approach by Glouberman et al. is a descriptive health-in-cities framework for intervening in the health of urban residents. Within this framework, improving health in cities was discussed as a *“matter of making numerous small scale interventions, selecting those that prove to be effective, encouraging self-organisation among city dwellers, and constantly modifying approaches as the system continually changes and adapts”*.⁴² The framework emphasises the need to consider the various factors when developing approaches to health in cities. According to Glouberman et al., health is greatly affected by interactions with the natural, built, and social environments, not just the individual's biological characteristics.⁴³ These aspects of the environment interact with people and each other, rather than just 'impact' health, in a complex and unpredictable way over time.⁴⁴ The authors find this 'web of interactions' understanding central to discussions as it renders the language of 'determinants' of health, suggesting mechanistic, linear, one-way links, constant over time, as deceptive.⁴⁵

Rydin and colleagues also shared Glouberman et al.'s views regarding the need to use complex systems thinking and approaches when considering health in cities.⁴⁶ In their view, urban health outcomes are shaped by multiple associations between elements. Relationships are not linear, and causation is multi-directional; causes can be outcomes, and feedback loops should form a shared feature of these complex systems that considers uncertainty in predicting health effects when interventions are introduced.⁴⁷ Rydin et al. considered cities as networks with emergent properties using ecological thinking concepts.⁴⁸ Diversity was another key aspect unique to cities as a 'patchwork of communities' where understanding the social complexity of different stakeholders with conflicting interests in each location was deemed necessary.⁴⁹ Rydin et al. analysed the links between the physical fabric of cities and towns (referred to in the report as the built environment) and urban health outcomes using a complex systems approach.⁵⁰ From a broad macro-level scale, urban health outcomes were illustrated as a consequence of the interconnections between society and governance processes; urban planning, policy-making, and management; aspects of the built environment; how the built environment affects health; and the health outcomes themselves.⁵¹ Health represents the absence of disease and the presence of mental and physical wellbeing depicted as health outcomes.⁵² In general, their approach focussed on how interventions in the built environment affect health outcomes using five case studies of specific 'urban systems', such as the built indoor environment and health, to show the complexity of linkages.⁵³

PRACTICE-ORIENTED APPROACHES

This third category of approaches synthesised from the literature attempted to incorporate complex systems thinking within broader, holistic, and practice-oriented frameworks and models linking health and urban environments. The approaches conceptualise concepts in an approachable way for applied disciplines and professional practices, including urban health, design, planning, policy, and healthy urbanism. Some approaches highlight the complexity, dynamic, and systemic factors that link urban places with health. Diez Roux conceptualised places as integral components of systems that cause health.⁵⁴ Specifically, health and environmental outcomes were perceived as driven by the dynamic processes and relations between factors across different levels. According to Diez Roux, four features characterise complex systems:⁵⁵

1. Various factors operate at different levels of organisation (i.e. cities, neighbourhoods, homes, individuals)
2. The presence of heterogeneous interacting units (i.e. different types of people or neighbourhoods)
3. There are dependencies and interactions between factors and units, and
4. The presence of balancing or reinforcing feedback between factors.

Diez Roux also conceptualised the links between urban places and health using three additional ways to help understand these links in practice: as contexts for health, causes of health, and as moderators or reinforcers of individual health differences.⁵⁶

Sarkar and Webster created an urban health niche model (2017) to explain the multiple pathways that shape health within the urban environment using complexity thinking and an approach inspired by contemporary social epidemiology theories and associated eco-epidemiology multilevel frameworks.⁵⁷ The model is driven by the link between healthy urban environments and the sustainable development goals.⁵⁸ It is based on the notion that the state of human health—at the individual and population levels—is a product of a complex interplay between multiple causative factors that act at multiple levels and scales.⁵⁹ The urban environment in their model represents the natural, built, and social acting as determinants of health.⁶⁰ This urban health niche model—originating in a book⁶¹—was designed as a holistic and spatially explicit health model related to urban and public health planning. The authors considered it a method for empirically modelling the healthy city by investigating the links between urban design (the built environment configuration or urban morphology) and health.⁶² Therefore, the model is concerned with explaining the complexity of health itself to integrate multilayered data sets related to health, socio-economic, built and natural environments.⁶³ It provides a high-resolution health niche database that would specifically benefit this configuration and design of land use and street networks.⁶⁴ Health and disease are explained as self-evolving in ‘space-time’ due to complex dynamic non-linear interactions between diverse factors that function at multiple levels (at the cellular, molecular, individual, population and societal levels of the organisation) and at different spatial scales.⁶⁵ The model also emphasises the need to consider interactions between the biological, lifestyle, behavioural, social, built and natural environmental factors and relevant social, urban and public health policies.⁶⁶

Recently, Pineo proposed an urban planning and design framework—Towards Healthy Urbanism: Inclusive, Equitable and Sustainable (THRIVES) framework.⁶⁷ The THRIVES framework builds on previous social epidemiology and ecological public health theories and concepts that emphasise ecological and systems thinking.⁶⁸ Pineo brought three broad areas of new knowledge and theory into their framework: the structural barriers to health, the climate crisis and environmental breakdown and their urgency, and the health impacts of poorly regulated developments, especially for underrepresented groups.⁶⁹ The framework itself is based on three core principles (sustainability, equity and inclusion) and three scales of health impact (planetary, ecosystem and local) that shift health focus from people and their characteristics to consideration of the ecosystem and planet.⁷⁰ The three scales are also

informed by evidence-based planning and design indicators (called goals) that demonstrate where built environment decision-making can be applied by any built environment professionals.⁷¹ Although the framework attempts to build on previous theories and concepts, it explicitly addresses existing gaps in knowledge by professionals who deal with urban development in relation to healthy urbanism, including built environment professionals, developers, and surveyors.⁷² Pineo views their framework as a “*new tool that reframes existing conceptualisations of healthy urban development, helps stakeholders reach shared understanding of the relevant concepts and guides better policy and design decisions*”.⁷³ Therefore, the framework aims are designed to guide urban development through a new way of conceptualisation that integrates health into urban development.

In 2017, von Szombathely and colleagues, proposed a conceptual model of health-related urban wellbeing,⁷⁴ which builds on previous models of healthy cities discussed above. It considers complexity and addresses how the urban system affects urban populations. The conceptual model is built on a simple binary system of human and environment represented by citizens and urban environment inspired by the separation between society and biosphere/environment in Hancock’s Mandela of Health.⁷⁵ The model’s conceptual starting position and approach is ecological, derived from the Millennium Ecosystem Assessment Model (MEA).⁷⁶ MEA is an ecological approach to health where various wellbeing dimensions are interpreted as interdependent on environmental impacts and ecosystem services.⁷⁷ Von Szombathely *et al.*’s definition of health goes beyond the absence of disease and expands to different domains of wellbeing and quality of life.⁷⁸ Therefore, their target value is health-related urban wellbeing; which they called (UrbWellth), defined as “*the wellbeing of an urban population*”.⁷⁹ UrbWellth encompasses different domains related to physical health (objective health status), mental health (subjective health status), emotions (affective wellbeing), nature (e.g., climate), urban-specific environment (e.g., public parks), political system (e.g., urban governance), social functioning (e.g., neighbourhood), and social context (e.g., social position).⁸⁰

The simple binary outline of the UrbWellth conceptual model is subdivided into four sectors: individual characteristics, the urban society, the urban morphology, and environmental stressors.⁸¹ The need to combine all four sectors within this binary outline is driven by systems thinking and approach and an understanding of the complexity of urban structures and dynamics as they relate to UrbWellth, where various factors are considered from different angles in a systematised method.⁸² The binary social-ecological systems approach to health appears to be supported by contemporary ecosocial epidemiology theories and principles of political ecology and environmental justice. These address social stratification issues, inequalities in health, and resource distribution as they relate to state policies, interstate relations and global capitalism.⁸³ The authors also tried to address the added risk multipliers to health as a result of the accelerating urban vulnerability from environmental degradation, unsustainable production and consumption patterns, pollution, and rapid urbanisation alongside other changes related to lifestyle, new forms of social organisation, demographic change, and climate change.⁸⁴ Therefore, a vulnerability layer/filter is included in the model consisting of three elements: exposure, sensitivity, and adaptive capacity, which are used as an indicator of how susceptible an urban system (the binary human-environment system) is to multiple risk factors.⁸⁵ In terms of the application of the model, the authors see it best used for future city planning interventions.⁸⁶

CONCLUSION

This paper provides a high-level synthesis and description of conceptual approaches linking health and urban environments to help researchers and practitioners navigate this rapidly changing research area. The landscape of conceptual approaches to health in relation to the urban environment has seen a significant transformation over the years. Although early public health models were not exclusive to the urban environment, they guided successive conceptualisations and approaches to health and urban

environments. Subsequent approaches that looked at healthy cities and the planning of healthy settlements transformed these conceptualisations further, especially with their complex views of cities. Recent broader, holistic, and practice-oriented approaches have extended their complex views of cities to urban environments and places. Overall, the review demonstrates that researchers are actively developing frameworks and models to connect all theories, concepts, and interrelationships between factors that influence health concerning urban environments using complex systems and ecological thinking. This area of research is fast-moving, and recent publications suggest that researchers are beginning to piece together the complexity of health and urban environments using holistic conceptual frameworks and models.

NOTES

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- ⁵ Hancock, "The Mandala of Health", 1.
- ⁶ Hancock, "The Mandala of Health", 1.
- ⁷ Hancock, "The Mandala of Health", 4.
- ⁸ Hancock, "The Mandala of Health", 1.
- ⁹ Hancock, "The Mandala of Health", 1-3.
- ¹⁰ Hancock, "The Mandala of Health", 3.
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- ¹⁴ "A Conceptual Framework for Action on The Social Determinants of Health," World Health Organisation, 2010, accessed 6 June 2024, <https://www.who.int/publications/i/item/9789241500852>, 15-16.
- ¹⁵ Rayner and Lang, *Ecological Public Health*, 28.
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KEY DETERMINANTS OF INNER-CITY RESIDENTIAL MIGRATION OF OLDER PERSONS

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INTRODUCTION

This paper explores these apparently conflicting priorities. It draws on a broad church of research, and argues that by thinking creatively it is possible to make advances in each separate area to mutual advantage. In so doing, housing can be created which is more spacious, sustainable and affordable. With socio-economic development, population aging has become a global issue. According to WHO, a region is considered aging if 10% of its population is over 60 or 7% is over 65. China faces severe aging challenges due to its large population. The UN projects that by 2025, 34% of China's population will be over 60, and 22% will be over 80. This demographic shift presents significant challenges, particularly given China's imperfect welfare system.¹ The Seventh National Population Census shows that 24.861 million Chinese aged 65 and older live alone.² This trend reflects a shift from traditional family support to more independent living, supported by pensions and insurance systems.

China's rapid urbanization has diversified housing choices, facilitating easier residential transfers for both younger and older residents.³ This has led to a rethinking of the traditional concept of "aging in place." Older adults now rely more on community resources, demanding livable environments.⁴ The construction of such environments is crucial for improving the quality of life for older adults and understanding urban aging and residential migration.

Research on residential migration of older people has been extensive in developed countries, focusing on various spatial scales.⁵ These studies highlight the importance of understanding migration patterns at smaller scales.⁶ However, in China, most research has focused on inter-provincial migration and factors influencing migration behavior or intentions.⁷ There is a need for more empirical research on intra-urban migration of older people in China.⁸

This paper aims to study the factors influencing intra-city residential migration of older people in Yancheng City from 2016-2018. It examines the impact of housing attributes, such as prices, and public attributes, such as community facilities, on relocation decisions. This study extends previous work by providing an empirical analysis at a smaller spatial scale, offering in-depth insights into individual migration factors, and utilizing quantitative data analysis to explore new methods in location choice research.

LITERATURE REVIEW

The residential migration of older persons within cities has been a significant focus of research, particularly in Western countries, while in China, this area remains underexplored. Various studies have identified patterns and influencing factors of such migrations, highlighting the importance of understanding these movements for urban planning and social services.

Migration Patterns and Influences

In the United States, studies using census data from 1970 to 1990 reveal that older populations have increasingly moved from metropolitan to non-metropolitan areas, especially to small and medium-sized cities in the Sunbelt and the West⁹. Similar decentralization trends have been observed in Italy, Canada,¹⁰ and Australia, where retirees prefer regional centers and rural towns over metropolitan areas.¹¹ In France, older individuals often leave large agglomerations and old industrial areas for more attractive regions with better climates and social environments.¹²

In China, intra-provincial migration dominates the movement of older adults, with a significant portion occurring within metropolitan areas and border provinces. About 80.29 percent of older migrants in China are involved in intra-provincial migration, particularly in provinces like Sichuan and Heilongjiang.¹³ Research indicates that longer migration distances correlate with poorer psychological and physiological health among older migrants, leading to a preference for shorter, intra-city moves.

Intra-City Migration Dynamics

Within cities, two main patterns have emerged. In Kansas, USA, older residents either migrate from the central city to suburbs or within the city to neighborhoods close to the CBD. Those moving to the suburbs generally have higher disposable incomes and greater social activity, while those moving to the CBD often have lower incomes and a higher need for public services.¹⁴ Similarly, in Australian urban areas, older adults often move to specific local centers, transitioning from central regions to less dense surrounding suburbs as they age.¹⁵ Recent studies in Seattle, USA, show a trend of older residents migrating to more urbanized neighborhoods, reflecting a growing preference for urban living.¹⁶

In Europe, migration of older residents to central urban areas is common. In the Netherlands, most older migrants move within their communities or towns rather than from urban to rural areas.¹⁷ In Sweden, migration patterns differ by birth decade, with older cohorts more likely to move to city centers and younger cohorts to the suburbs.¹⁸ In Japan, most older migrants move within the same prefectures,¹⁹ a pattern also observed in England and Wales.²⁰

Chinese Context

In China, the intra-city migration of older adults has not been extensively studied. Existing studies focus on qualitative data from a few cities, examining the willingness and influencing factors of such migration. For example, in Beijing, healthy and financially stable older individuals tend to migrate to urban centers, particularly to communities with amenities like lifts, green spaces, and convenient living environments.²¹ In Chengdu, retired older adults prefer communities with environmental accessibility and friendly neighborhood interactions.

Research on intra-city migration in China highlights that existing studies primarily explain the probability of migration behaviors or preferences but lack comprehensive analyses of changes in location and influencing factors. This gap suggests the need for finer-scale research, particularly focusing on the determinants of intra-city migration and the localization of 'ageing in place'. This paper utilizes GIS and home purchase data from Yancheng City between 2016 and 2018 to provide an in-depth analysis of these factors at the individual level.

In summary, the residential migration of older persons within cities involves complex patterns influenced by various factors, including climate, social services, and housing. While Western countries have conducted extensive research in this area, there is a significant need for more detailed studies in China, particularly at the intra-city level, to better understand and address the needs of the aging population in urban settings.

DATA AND METHODS

Study area

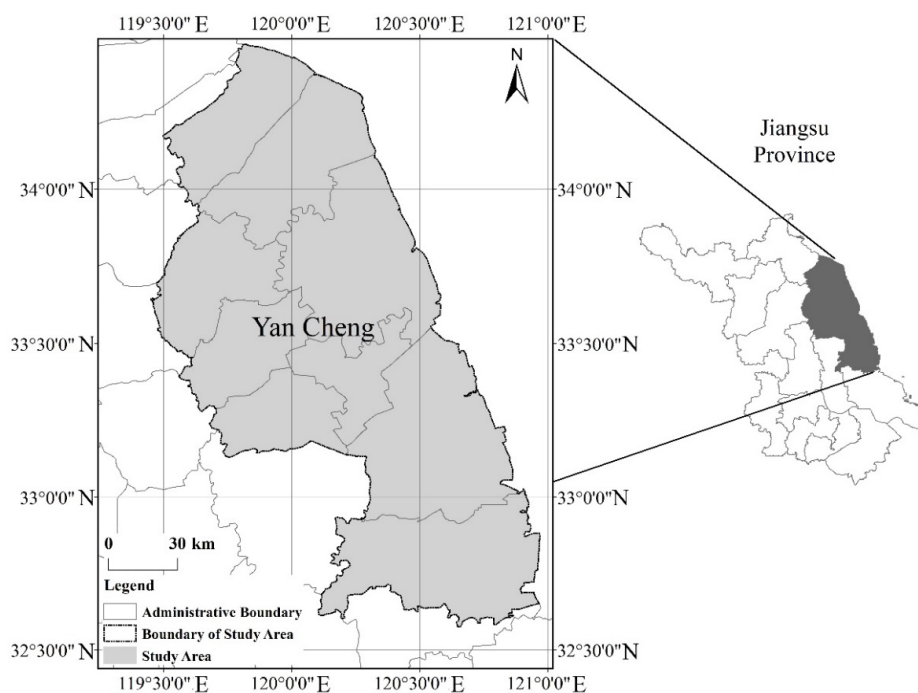


Figure 1. Study area of the city of Yancheng.

According to the 2020 census, Yancheng (Figure 1) had 1,833,100 residents over 60, making up 27.32% of its population—significantly higher than the provincial (21.84%) and national (18.7%) averages. Entering the aging stage in the 1990s, Yancheng has seen a rapid increase in its older population, emphasizing the need for effective old-age care.

Recent rapid urbanization in Yancheng includes public housing construction, shantytown renovations, and rural land incorporation into urban development, leading to the relocation of many residents. Older adults have moved from unit housing or rural cottages to new neighborhoods, significantly altering their living environments and cultural settings.

This study examines the impact of housing characteristics and public service facilities on the relocation choices of older residents in Yancheng, aiming to understand their needs in a rapidly urbanizing environment.

Data

To avoid the impact of COVID-19 on home-buying decisions, this study uses home-buying data from older adults in Yancheng City, collected from 2016 to 2018. The sample includes details on homebuyers (age, gender, co-ownership, current residence) and housing data (unit price, address, floor level, year of construction, floor area). Older people are defined as men aged 60+ and women aged 55+.

The study focuses on intra-city migration within Tinghu and Yandu Districts, excluding remote Dafeng District. The dataset comprises 3,791 eligible older people and 282 neighborhoods. Using Python on the Gaode Map platform, we identified 282 subdivisions and gathered Points of Interest (POI) data through data crawling. ArcGIS was used to create buffer zones and calculate public facilities within a 1 km radius.

Based on on-site research and existing literature,²² we constructed a '15-minute community living circle' with 6 primary indicators (culture and sports, education, healthcare, older care, leisure, commerce) and 19 secondary indicators. We selected 4346 POI data points related to basic public services for older residents. The classification and number of facilities are shown in Table 1.

Classification	Element	Quantity/pc	Percentage%
Educational facility	Kindergartens, primary schools	534	12.29
Medical facility	General hospitals, specialist hospitals, clinics, pharmacies	1213	27.91
Cultural and sports facilities	Cultural activities, residents' sports halls	291	6.70
Leisure facility	Parks, leisure squares	250	5.75
Retirement facilities	Older universities, nursing homes, assisted living for older people centres	157	3.61
Commercial facility	Supermarkets, food markets, fruit shops, hairdressers, bathrooms, chess and card rooms	1901	43.74

Table 1. Filtered facility poi data classification

Processing of geo-spatial data

We used ArcGIS, Gaode Map API, and other tools to geocode the residential addresses of the studied individuals, creating a spatial dataset to analyze residential migration paths and locational changes. The purchase addresses were categorized into 282 neighborhoods. These neighborhoods were further classified based on the concentration of older adults: high concentration (more than 100 older adults purchasing homes) and low concentration (fewer than 100 older adults purchasing homes).

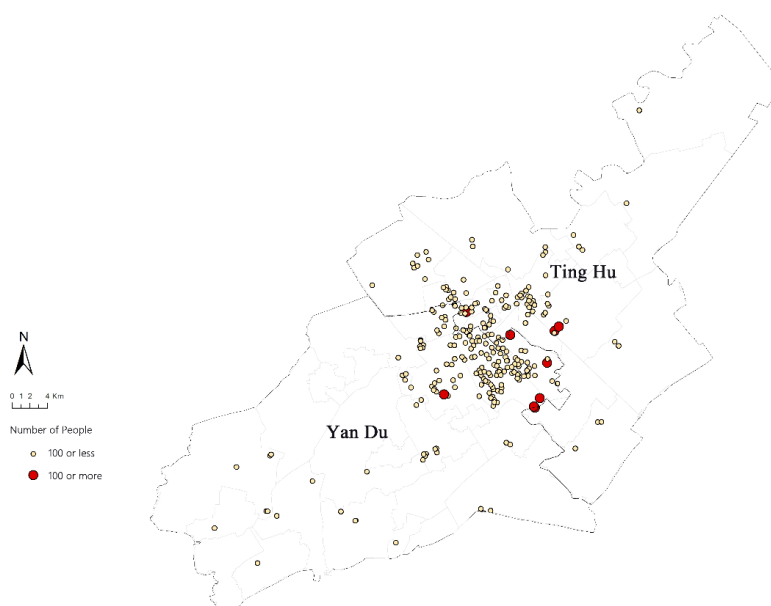


Figure 2. Distribution of neighbourhood agglomeration after migration

Figure 2 illustrates the 282 neighborhoods where older individuals have relocated, with neighborhoods hosting more than 100 movers highlighted in bold. Remarkably, neighborhoods exceeding this threshold account for 40% of the overall study sample. The analysis reveals that the majority of these communities are situated in the city center at the border of Yandu and Tinghu districts, with only a few located in remote areas of the two districts. Interestingly, neighborhoods witnessing a substantial influx of movers are not centrally located but rather on the outskirts. This trend is attributed to the high housing prices in the city center, prompting older individuals to seek areas with more affordable housing costs post-retirement.

Independent variables

Table 2 outlines the independent variables in the decision tree model, categorized into housing and public attributes. Housing attributes include average floor area, floor level, and house price in the district. Public attributes encompass commercial, educational, medical, cultural, recreational, and older care facilities. The dependent variable indicates whether older adults moved to high-concentration neighborhoods (over 100 older migrants, 40% of the sample) or low-concentration neighborhoods. Findings suggest older individuals prefer areas with lower living costs to reduce post-retirement expenses, with housing prices reflecting the quality and quantity of amenities. First-tier cities offer superior amenities but at higher costs.

Classical theory suggests that older individuals tend to relocate to areas with improved facilities post-retirement to enhance their quality of life.²³ The variable "number of medical facilities" was utilized to gauge regional disparities in healthcare service provision. Similarly, the variable "leisure facility" was employed to assess the availability of public green spaces, which have been linked to the well-being of older individuals.²⁴

Variable name	Variable Description	Average value	Standard deviation
Housing Properties			
building area	Average floor area of commercial buildings in the district (m ²)	118.5957	33.64764
story	Average floor level of commercial properties in the neighbourhood(floor)	7.578	4.53252
cost of housing	Average sales price of commercial property in the sub-district (¥ / m ²)	5719.6986	3247.02825
Surrounding Public Properties			
Commercial facilities	Number of supermarkets, food markets, restaurants, fruit shops, hairdressers, chess and card rooms within 1 km of the district (number)	12.7092	20.17699
Educational facilities	Number of kindergartens and primary schools within 1 km of the neighbourhood (number)	2.4007	2.95501
Medical facilities	Number of general hospitals, specialist hospitals, clinics and pharmacies within 1 km of the neighbourhood (number)	4.3723	7.74503
Cultural facilities	Number of cultural activity centres and residential sports halls within 1 km of the district (number)	1.9149	3.32036
Leisure facilities	Number of parks and recreational plazas within 1 km of the neighbourhood (number)	1.3227	2.36646
Retirement facilities	Number of senior citizens' universities, nursing homes, and assisted living centres for older people within 1 km of the neighbourhood (number)	0.5567	1.48969

Table 2. Descriptive statistics of independent variables

Results of the decision tree

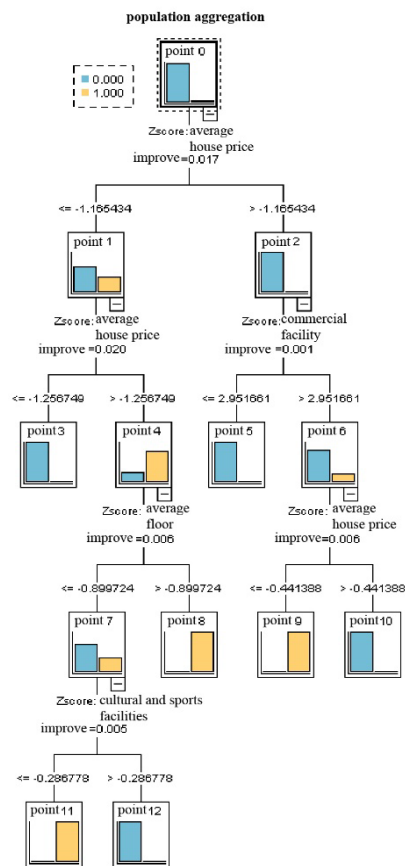


Figure 3. Residential Migration Decision Tree CART Modelling

Figure 3 shows the decision tree CART model, which, with a risk assessment showing standard errors below 0.02, indicates a good fit. The 10-layer cross-validation model correctly classified 283 cases with 100% accuracy. The model highlights how housing and neighborhood attributes influence older adults' residential relocation choices. Key factors include lower housing prices and the average floor level. Among neighborhood facilities, the number of commercial and medical facilities significantly impacts location choice, while educational facilities do not, suggesting proximity to schools is not a primary concern for older adults when selecting housing.

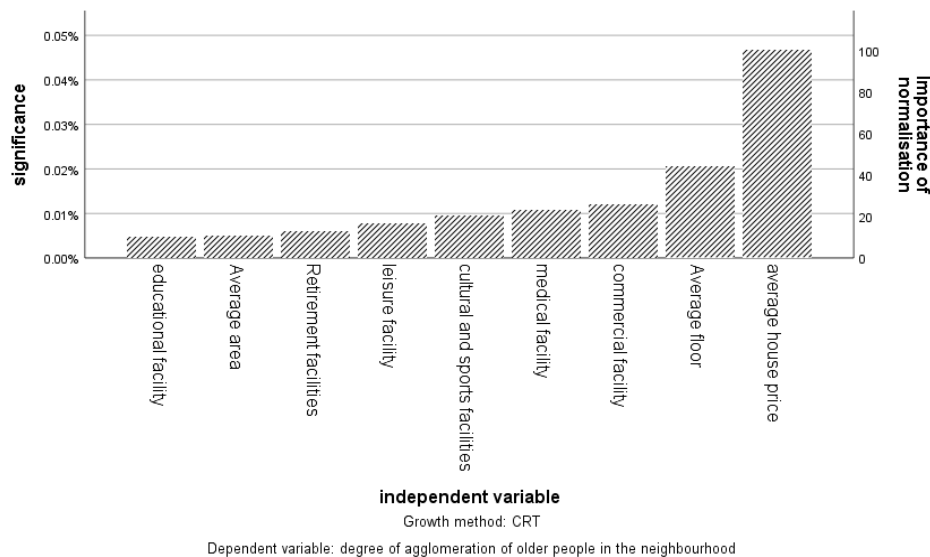


Figure 4. Order of importance of independent variables

Figure 4 illustrates the decision tree model's analysis of housing and public facility attributes influencing older individuals' relocation choices. The importance of indicators is shown in bar charts, ranked as follows: average house price > average floor > commercial facilities > medical facilities > cultural and sports facilities > leisure facilities > older care facilities > average size > educational facilities. House price is the primary consideration for older people when selecting a neighborhood, with floor level being the second most important. Among neighborhood facilities, commercial facilities are most influential, followed by medical, cultural, and sports facilities. Leisure, older care, and educational facilities are less significant. Ultimately, average house price plays the largest role in determining neighborhood choice for older adults.

DISCUSSION

This study aims to fill a knowledge gap by examining residential migration patterns of older people at a finer spatial scale in Yancheng City. Using housing purchase data from 2016 to 2018 and tools like ArcGIS, the study highlights key trends and factors influencing older people's migration behavior.

The majority of older people (42.8%) are aged 60-65, typically associated with retirement and good health. Migration behaviour at this stage is often aimed at finding better living conditions and lifestyle changes. Around 23% move within the same municipality, with 40% of these moving to new streets. The rest (77%) move to different streets, with Yandu Street being the most common destination due to passive relocation and resettlement initiatives. Migration primarily occurs between neighboring streets over short distances.

The decision tree model identifies house price (normalized importance 100%) and average floor (44.2%) as critical factors in migration decisions. Dwelling characteristics and neighborhood public amenities significantly influence these decisions. Commercial facilities show a strong association with the relocation choices of the elderly.

Similar to Japan, where older people show dual migration trends (centrifugal to suburbs and centripetal to well-equipped urban areas), Yancheng City exhibits both tendencies. Older people often migrate towards city centers for better amenities and lower house prices, while young people working in urban areas rely on their retired parents for childcare support.

The paper contributes in three key areas. Firstly, it bridges the research domains of residential migration and location choice, expanding geography's exploration into housing behavior. While prior studies

focused on the factors influencing migration and their implications for urban spatial structures, this study examines the concurrent roles of housing attributes and location-related attractions (e.g., public services, cultural facilities, real estate prices) in older individuals' migration. Unlike previous research in China that treated older migrants as a homogeneous group, this study analyzes their heterogeneous migration preferences at the individual level. Secondly, it develops an analytical framework based on existing literature to dissect the factors shaping residential location choices, emphasizing the accessibility of neighborhood amenities. This framework lays the groundwork for future research on residential location influencing factors.

Lastly, using POI data from tools like the Gaode Map API, the paper provides a preliminary analysis of the characteristics and influencing factors in older individuals' residential location changes in Yancheng City. It offers new perspectives, highlighting the significant impact of surrounding commercial facilities on location choice.

The study has temporal mismatches between POI data and home purchase records (2016-2018), which may introduce bias. The current analysis categorizes residential locations based on facilities within a 1 km radius. Future research could include other indicators like neighborhood type, accessibility, and migration distance for a comprehensive portrayal. Expanding the study period and including more cities could allow comparisons across different historical periods and regions, providing deeper insights into older individuals' migration patterns in various contexts.

CONCLUSION

This study provides valuable insights into the residential migration patterns of older people in Yancheng City, emphasizing the roles of housing characteristics and public facilities. The findings have practical implications for urban planning and policy-making, highlighting the need for affordable, accessible housing and quality neighborhood amenities to improve living conditions for older adults. These insights guide the development of mixed-use neighborhoods and policies to maintain lower house prices or provide financial assistance.

By bridging residential migration and location choice research, the study develops an analytical framework focusing on neighborhood amenity accessibility. It uses POI data to analyze residential location changes, revealing the impact of commercial facilities.

The study fills gaps in existing research and sets the stage for future studies to explore residential migration dynamics among the elderly, addressing limitations like temporal data inconsistencies and geographic coverage. Ultimately, it underscores the importance of housing and neighborhood amenities in shaping older people's residential choices, informing more targeted urban planning and policy interventions.

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THE WORK OF (PUBLIC) ART IN THE AGE OF MASS PROTESTS: COLOURFUL NECKLACE OR URBAN NOOSE?

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INTRODUCTION

The first edition of this conference entitled Livable Cities took place in New York, and coincided with stunningly beautiful, yet toxic images of orange sandstorm literally covering the city. This made the topic – how to enable cities to continue not only to grow but also to be lived in - incredibly pertinent and timely. The second conference iteration took place in London, where the toxic colouring this paper highlights happens more subtly, yet the message is stunningly similar. Instead of cleaning up our cities we're making them more wasteful and allowing them to literally fill up with rubbish. This is occasionally under the pretence of 'essential food stores', the very opposite of what is actually sold in US Candy Stores proliferating British high streets since the pandemic. As suggested in the title, the work of public art is very much under the threat, with its basic existence questioned. Under an onslaught by tourists and consumerism, public art is increasingly also under a threat from frequent and precarious protests. At best the art tends to be ignored, at worst, it tends to be misappropriated, violated, attacked and even completely destroyed. Public places are saturated with toxic colours double traces of protests / tourist trails. Mass demonstrations also impact on public services as ambulances, fire brigades and police are all put under pressure to secure the protests, at the expense of dealing with other accidents, illness and crime. The common traits seem to be that the public spaces get politicized, overcrowded and wasteful.

Increasingly we find ourselves avoiding urban centres as they become only accessible to those wishing to spend short time either for a protest or for an expensive touristic visit. The urban centres are saturated by waste, concentrating as quickly as it's being generated, and cleaned only partially. Due to overcrowding and ever-increasing pressure - it is also becoming more difficult to do what might be one of the most important qualities of living – walking at a slow pace, being able to pause and absorb street performance and other activities. Public art is also being consumed with a dazzling speed and more often than not, ignored at the expense of political issues culminating with street protests. Not only they make slow enjoyment of urban spaces impossible, but the issues that these protests are highlighting are often in direct conflict with each other and at least apparently in danger of descending into a violence.

NO TIME FOR PAUSE

This paper deals with temporary architectural/art interventions residing in public spaces. One of the difficult questions we will be asking is whether protests need limiting in some ways. Another pertinent query is whether protests should be seen as a natural progression for the type of street art that has always flirted with vandalism and often tolerated because it is seen as an important outlet for artistic

expression beyond commercial art. Anonymous art with political message tends to be seen more favourably and acceptable than the conventional art inside the galleries. The issues that also need probing involve - who does the urban public space belong to, and how can architects and designers creatively contribute to make spaces for a pause and to reverse the current trends of filling all available space with ever more crowds. It can be argued that any such spaces are public in name only, in reality they belong to those making profits – large chains with complex ownership structure - little of which goes back into the cities themselves. Instead of playing into hands of such exploitation of public space and services, art and architecture needs to reinsert creative pause into our cities, making the overall public space experience more balanced.

HIDDEN IN PLAIN SIGHT

The most public of all public spaces in London, one of the largest global cities – Trafalgar Square - is covered in conventional sculptures of famous male historical figures. The 4th plinth¹ is different – initiated in 2000 – it is the only temporary contemporary sculpture amongst numerous old established ones. It is worth recollecting that even at the outset – one of the very first pieces – was closely followed by the protests, overshadowing and hijacking the space for a political message. Many protests active in this space are only encountered by the tourists. People occupying public spaces tend to be visitors to the area, with only a small number of those actually working and living in the city. Often, the demonstrators include conflicting groups protesting against the same issues from opposing sides – for example recently pro-Israel and pro-Palestine demonstrations meet and collide in the same physical space. Closely connected with a limits of physical space are the questions of who should be given a priority and what is the architect’s role in this process? Seminal piece “The Need for New Monumentality” by Giedion² still resonates today – as it seems that architects tend to exclude themselves from public space discussions and what’s even worse, are often blamed and criticised for matters outside of their control. There is a pressing need for architects to have a more meaningful role in contributing and helping reconceptualise monuments and other features of our urban spaces. In the age of mass protests, public space gets heavily scrutinised, yet many issues hide in plain sight. The only consistent feature over time seems to be ever more gatherings and a pressure on a physical space to accommodate and absorb more.

The title of this paper alludes that the public art is under threat. Not only that but curiously it seems that whilst it is apparently in full sight yet frequently gets rendered invisible. Collective space gets taken from us all and replaced by toxic elements which directly negatively impact on the livability of our cities.

PROTESTS MUST BE PUBLICISED

Public sculptures get used for protesting against often bizarre even frivolous or at best unnoticed issues – an example in point is that of the Anthony Gormley’s piece One and Only on the 4th plinth in 2009 which offered an opportunity for an ordinary person to use the plinth as they see fit for an hour at a time. Rachel Wardell was meant to be the first person, but in fact, the anti-smoking protestor Stuart Holmes became the first person that managed to circumnavigate security and climb onto the plinth. The current sculpture on the 4th plinth, named Antelope, by Samson Kambalu,³ in 2022 - has a powerful message, addressing painful and embarrassing injustices of our history. Yet Antelope’s execution is perhaps too subtle, and not enough people try to understand and read about the meaning behind art, usually drowned out by the shouts of those only concerned with their protest.

More recently miniscule protest took place with a small group of people wearing Boris Johnson’s masks demonstrated next to the 4th plinth. Carrying bottles of beer they filmed themselves shouting “this is not

a party". Needless to say it was unclear who this protest was intended for, as they were completely oblivious to their surroundings and nobody in the square took much notice of them. None of the protestors certainly didn't pause to admire public art pieces and most probably didn't care to notice what was on the 4th plinth or in any other spaces. The event was most likely publicised in narrow circles on social media and used to increase the pressure on the prime minister at the time to resign. Years later, traces on social media⁴ deceptively suggest that a much larger event took place instead.



Figure 1. The End by Heather Phillipson and Boris Protest. 2022.

Similarly with very little direct effect Extinction Rebellion frequently poured paint outside the Downing street. Each protest was filmed and even though the actual paint damage was removed and very little trace of the protest remained, even only hours afterwards, the social media records show different picture. The XR spokesman frequently state how the activists are ready to sacrifice their liberty for their cause, claiming all our children's future is at stake here. More meaningful protest was carried out by the same activist organisation during the lockdown in 2020. The shoes were donated and then gifted again to a charity without any damage and no waste. The square was completely empty, providing large vacant space to create a powerful visual impact for everyone to see. The message highlighted the needs of poor children in danger of becoming invisible and neglected during the pandemic. The image created was impactful and strong, yet temporary and not wasteful.

However, since 2019 many times similar type of installations came about in global cities, including again in Trafalgar Square, recently to highlight the plight of the Palestinian and Israeli children in Gaza on the steps in front of the National Gallery. The rest of the square was saturated by people, mainly tourists. Similar grids emerged in Ukrainian cities – poignant grid of empty prams symbolising the number of children being killed in the conflict. The message of the work remains political, the execution, repetitive and iterative. The precision is also irrelevant – the broad message is accepted as the only important one. Work of public art tends to have a very limited duration and is produced by many authors. One has to question whether the power of the message is diluted in this way, becoming lost in full visibility, also because the same image is applied to too many issues on too many sites, without any clearly identifiable distinction. It's acceptable and perfectly possible to protest, to visit, even to live on our streets, but to walk slowly and enjoy urban centres at a slower pace, seems difficult even during so-called quiet times.

ARCHITECTS GET BLAMED

Unless personally involved architects tend to be excluded out of public art issues leaving it to the activists and/or politicians or even civil servants to deal with. If architects get involved this comes despite their best intentions and the constraints they faced due to being entirely dependent on the will of the client and the contractor. Most worryingly, architects often get blamed for issues largely outside of their control.

Mound by Dutch architects MVRDV was commissioned by Westminster council in 2020. Intended to reinvigorate one of the most prestigious shopping locations in the world – Oxford Street – the structure quickly became a magnet for criticism.⁵ It was initially envisaged that it should be located on Marble Arch itself to offer shoppers' views down the whole of Oxford street, an opportunity to see London's iconic avenue from a new vantage point.

The brief was in many ways impossible and misconceived, and the council itself was very much criticised. Unfortunately, MVRDV – the architects themselves - got hugely blamed even though, in many ways, all of the aspects that deserved criticism were outside of their control. Historic England prevented the Mound from being placed directly above Marble Arch - so the structure had to be moved next to the historic relic, making the promised views impossible.

This could have been an opportunity to inhabit and make a more permanent addition to the Marble Arch – a temporary disabled access – lift – should have been installed permanently. The cost implications for the lift depleted the funds for any additional features. Initially the design was similar to Kriterion⁶ stairs in Rotterdam in 2016, but here stairs were replaced by underwhelming planting which couldn't be walked on. Despite all this the architects should be commended, as they tried to insert structure which should be encouraged – creating more greenery and new views of the city. Somewhat ironically, because it was deemed to be a disappointing experience, the structure was made free, and in that way, inadvertently – more democratic and popular. The Mound brought visitors to the area, but clearly didn't bring shoppers back into the shops, because no structure could have achieved that. Mound showed that spaces which combine greenery and potentially exercise with exposing new city views could create breathing pockets that cities desperately need. Instead of being filled with more people, an existing fabric can be reinvigorated by inserting planting and nothing more.



Figure 2. The Mound, 2020.

From Mound, temporary green corner, we move onto repetitive urban feature which is much loved by tourists and often hated by the locals - red phone boxes. Once they were not only a source of national pride but very much necessary part of everyday communication. Now, at best, they are used by tourists, at worst by drug addicts and creating rubbish or as toilets, plaguing our city centres. They still make UK cities instantly recognisable and add much needed colour to grey urbanscapes. Yet the reality is that in prime tourist locations they are filthy and source of anti-social behaviour, no longer fit for their original purpose. Phone boxes are often vandalised and used in mass protests too. Reinvented or restored, a small number are also art pieces which add greenery and other uses. It seems certain that unless a more systematic approach is taken, phone kiosks will continue to deteriorate in full view of our urban centres and contribute to a general sense that city life itself is in danger.

Even more colourful are new additions to our public spaces particularly prolific during the pandemic – so called American candy stores – ridiculously classified as essential food stores (!?) which aided them in avoiding paying tax. They seem family friendly and harmless – standing in front of their colourful windows, one has to wonder what harm could they possibly cause? Yet behind their vivid facades - hiding in plain sight – is actually a blatant insertion of toxic sweets potentially leading to addiction and obesity; not to mention a large amounts of counterfeit goods regularly found here. Instead of harmless colourful neckless seems high time to see Candy Stores for what they truly represent – poisonous proliferation are literally strangling and stealing life out of our cities.

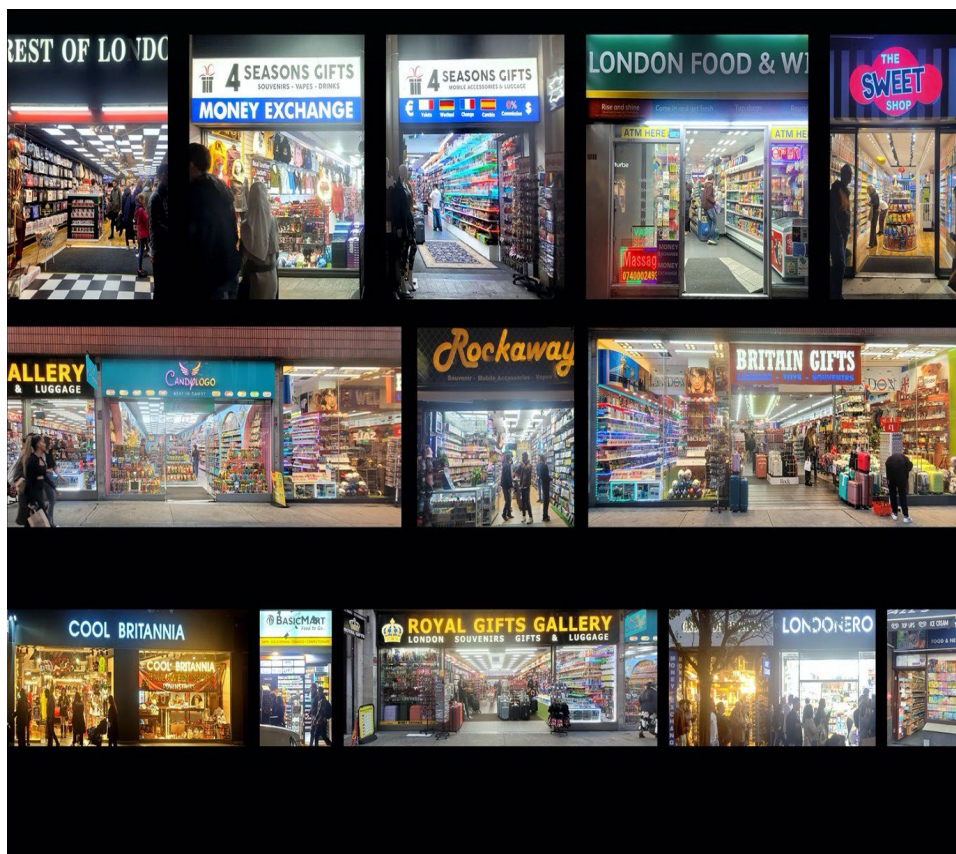


Figure 3. Candy Stores, 2023.

If we return to Trafalgar Square and recent protests in the National Art Gallery itself – by Just Stop Oil activists– who threw soup onto Van Gogh’s famous Sunflowers painting.⁷ They didn’t damage the painting as it was covered by glass screen, the audience in the gallery consisted mainly of tourists – not the ones who need to be convinced or would be able to respond to their protest. The target in this case – ordinary people – gallery visitors simply are not the adequate choice. Targeting them might actually achieve the opposite of their intended wish and garner less support for their cause. Just Stop Oil’s demands are so general and categorical that this would make most protests pointless. Perhaps there is something in the argument that an artist such as Van Gogh himself, would have supported violation of his work in this way. Could the radical artist who experimented with painting throughout his life, seen this not as a violation but as a radical update of his own work, and a welcome revision of his own masterpiece?

Related to this is Banksy, a graffiti artist who is both famous and apparently anonymous. His oeuvre is full of contradictions, and yet powerful and often also highlighting green issues and migrants’ plight. From an artistic or craft point of view Banksy’s art is quite limited. The meaning behind the work is left to be deciphered by the observer, similar to the identity of the artist – who rarely acknowledges his work. Somewhat paradoxically whether at the same time, the artist can remain anonymous and be mega famous, and pertinently the price of his works is very expensive. Just like the space it is placed in, it’s filthy, overcrowded and expensive. By and large, the audience is either interested in Banksy from commercial point of view and/or middle-class festival goers, who can afford to have a nice day out protesting and return to their middle class homes without being affected directly by the issues at stake.



Figure 4. 2x2 Squares, 2020.

CONCLUSION

Public art and politics have been inextricably bound together and trying to divorce the two seems futile. This puts the onus on artists and architects to embrace a challenge and wherever possible to reinsert the greenery and reclaim spaces lost to toxic retailers. Opportunities for art and architectural interventions are already politicised and commercialised and to survive need to combine with rubbish collection and cleaning points. Positive incentives for visitors and locals to reduce waste and help maintain green surfaces should also be encouraged. Opportunities for walking at slow pace must be prioritised, privileging the vulnerable and not prioritising able-bodied and young (which includes protestors). More spaces for a pause and break from urban life so that the crowds can be properly managed and those who profit are made to pay for infrastructural elements to help us all live better. The right to protest needs to be balanced against the right to be able to walk in the city at unhurried pace.

We need to stop blaming architects for issues outside of their control. Architects need to take an active role in the discussions over protests and balancing the demonstrations which create conflict and violence and repeat the same message repeatedly, which doesn't get stronger, but more diluted as it becomes clearer that there is little or nothing anyone can do to actually act on those matters. Even in the case of flawed, very much with the best intentions Mound, the great majority of the visitors are glad that anything was open at all, let alone an opportunity to see this corner of London, from a unique vantage point.

We should all be concerned that soon, the consequence of leaving public space matters to those that only see profit might mean that the toxic colourful noose-like spaces completely overtake our cities; making them full of people, yet completely devoid of a meaningful urban experience and unliveable.

NOTES

¹ For more information on the 4th Plinth Art Commission see the Mayor of London's Website <https://www.london.gov.uk/programmes-strategies/arts-and-culture/current-culture-projects/fourth-plinth-traffic-square/whats-fourth-plinth-now>

² Giedion, Sigfried. "The Need for New Monumentality" *Nine Points on Monumentality*, 1944, 549-558.

³ For more information on the artist and academic Samson Kambalu see: <https://www.magd.ox.ac.uk/people/professor-samson-kambalu/>

⁴ For more information see:

<https://www.express.co.uk/news/uk/1550360/downing-street-protest-boris-johnson-partygate-scandal-latest-news-conservative-masks-wigs>

⁵ Dezeen – design and architecture online magazine was one of the few publications that offered MVRDV an opportunity to give their point of view across - <https://www.dezeen.com/2021/07/30/marble-arch-mound-mrvdv-defence/>

⁶ This part of the chapter was based on the in-person conversation between the lead architect Gideon Maasland and the author in 2023.

⁷ For an article in support of this particular protest in the Guardian see –

<https://www.theguardian.com/commentisfree/2022/oct/22/just-stop-oil-van-gogh-national-gallery-aileen-getty>.

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HEALTHCARE AS A CRIME SCENE: EXPLORING CRIME OCCURENCES AND STRATEGIES FOR PREVENTION THROUGH CPTED

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INTRODUCTION

The healthcare sector, traditionally revered as a sanctuary for healing and care, and healthcare environments are often described in terms of qualities related to air, light, and atmosphere. Thereto the care environment needs to be safe, secure, and robust, not only for staff members, but also for patients and from a societal perspective. In both national and international research, employees in healthcare have a high exposure for being victims of violence.¹ In a Swedish study, 28% of the nurses had experienced being humiliated by patients, 24% been exposed to physical violence and 17% been threatened.² In addition, healthcare facilities can be a place for drug diversion, property crimes, and cyber-attacks.³

In contrast to other settings, healthcare environments and healthcare facilities have a built-in vulnerability for crime events, both expressive and instrumental crimes. Expressive crimes include for example unplanned acts of violence, assault and disorder, and instrumental planned acts for explicit goals, such as theft, frauds, or hacker-attacks.⁴ The risk for expressive crime is closely connected to the daily work-situations, such as working close to patients with pain, work in stressful situations which includes vulnerable individuals.⁵ Concerning instrumental crimes, healthcare facilities also have a high accessibility (easy to enter) and has valuable objects, such as medication or medical equipment, which can be highly desirable for theft.⁶ It has also been acknowledged in previous research that crime tend to diffuse from nearby areas into the healthcare facilities, making it vulnerable to external influences.⁷ In this explorative study our aim is to shed light on crimes taking place in Swedish healthcare facilities, by analyzing how the physical and organizational environment can inadvertently facilitate criminal activities, by examining the underlying factors contributing to the emergence of healthcare facilities as a crime scene. In addition, we will explore the possibilities of applying Crime Prevention Through Environmental Design (CPTED) to proactively design healthcare environments to deter and diminish criminal initiatives and activities.

A note on material and method

The material for this study was collected by a digital survey on crime occurrences and crime prevention in Swedish healthcare facilities. The survey had 13 questions categorized in three themes: background information, crime problem and crime preventive strategies, and perception of future crime problems in healthcare settings and bestow of both fixed questions and open questions. The survey was distributed through e-mail to representatives from the 21 Swedish regions responsible for healthcare settings and they were also asked to send it forward in their organizations. The survey was open for respondents to answer it between 2023-09-15 to 2023-10-15.

In total 26 respondents answered the survey representing eight of 21 regions. Most of the respondent was from Western Sweden (50.2%), followed by Region Stockholm (15.4%) and Region Skåne (15.4%). This, in turn, have some effect on our result, since approximately 80% of the respondents are representing a region which include one of the three major Swedish cities (Gothenburg, Stockholm, Malmö), and our result may be more valid for urban areas, compared to semi-urban or rural areas. The professional role of the respondents was mainly security manager (43%), followed by other (34%) and ward manager (17%). Only 4% of the respondents were working with facility management.

The analysis was conducted in two steps, first the numeric data were descriptively summarized and interpreted via frequency tables.⁸ In our result section, we will compare our results with previous research in the field, to enable a more elaborated discussion regarding crime occurrences and crime prevention, especially CPTED.

HEALTHCARE AS A CRIME SCENE

According to the International Labor Organization (ILO), every second employee in the healthcare sector will experience or be affected by violence at work.⁹ The question of violence in healthcare settings, is also not reported in statics due to a low propensity to report incidents.¹⁰ This makes it hard to estimate the actual extent of the problem. For example, in Acquardo Maran et al.'s study shows that 30% of employees in healthcare had been exposed to physical violence, and in a study by Ridenour et. al (2015) it is noted that 82% of the nurses in psychiatric care had been exposed to violence the last 30 days.¹¹

In line with previous research, violence, and threats of using violence was the most common crime category in our survey, there 28% of the respondents stated that violence or threats of violence had occurred against employees and 15% states that violence or violent threats had been used at patients or relatives to patients.

The respondents in our survey also acknowledge other types of crime besides violence, and property crimes, was the second most common crime category (22%), where 7% reported theft of drugs. Thereafter followed vandalism (10%), drug offence (7%) and cyberattacks (4%). Only a few respondents reported other types of crimes, such as antagonistic threats or unauthorized influence (3% respectively), arson (3%), frauds (1%), sabotage against infrastructure (1%) and other crimes (2%).

Especially the occurrence of property crimes (particularly theft) and vandalism, was quite frequent according to our survey, but it has seemingly not been so much researched, with one expectation – theft of drugs. Theft of drugs, or so-called drug diversion, was mentioned in previous research. In most cases of drug diversion, the care giver administrates a smaller dose than described, and use or sell the rest of the dose, resulting in, not only an addiction problem for the caregiver, but also a prolonged suffering and/or period of illness for the patient.¹²

Accordingly, our survey shows a great variety of crime types in health care settings, all from minor to major crime events. This result is probably due to the fact that instead of narrowing down to a few crime types, we constructed a multiple-choice question where the respondent could state all crime events that

had occurred, and in total we got 176 answers from our respondents. In addition, this more broad approach to explore crime events, displays the importance of mapping the incidence of crime more carefully and more local to understand the extent, particularly since the propensity to report crime in healthcare settings are low¹³ and the individual large consequences of being victimized.¹⁴

Different crime, different places

After answering questions regarding crime occurrences on a general level, the respondents were asked to define where they took place. In the analysis, we choose to differentiate between hospitals and health centers within primary care.

In hospital settings, crimes mainly occurred indoors at the wards, followed by common areas indoors and outdoors on hospital grounds. It was also a small tendency in our result that violence clustered at hospital wards and antagonistic threats, and unauthorized influence to occur in common areas (such as entrances), which is interesting from a theoretical perspective and a spatial difference between expressive and instrumental crimes in hospital settings. Hence, violence in hospital-settings is often triggered by an emotional response to restrictions, pain, or adverse care situations and therefore concentrates in corridors, patient rooms or similar. The antagonistic threats and unauthorized influence, on the other hand, is more dependent on the lack of witness and use more anonymous places.

At health centers within primary care most crimes occur in waiting rooms, followed by treatment-rooms and outdoors in the vicinity of the healthcare centrals. In contrast to hospitals, the spatial pattern here was more stable, showing that violence, antagonistic threats, unauthorized influence, sabotage, vandalism, and drug offences tend to cluster in waiting rooms. Highlighting that the waiting area is an especially vulnerable area, probably due to the lack of social control in combination with high access. This could be seen as a paradox, hence the more the layout is prepared for secure back room exits the less common use of the same spaces occurs. A further challenge is the digital queuing and app-based system that limit interpersonal contact.¹⁵

By exploring the spatial distribution in our survey, we could also see a connection between our result and previous research on risky situations and risky places in healthcare settings, which has been researched in relation to violence and/or threats of violence. Risky situations in relation to violence include: direct patient caregiving, meetings with dissatisfied and/or agitated patients understaffing, working alone, many new employees or substitutes, patient transports within or between healthcare providers, working with long waiting times, overcrowded or uncomfortable waiting rooms.¹⁶ So-called hot spots, where violence often occurs in the healthcare environment, primarily include; entrances, corridors and waiting rooms short of capacity, poor lighting, bad air, too high or low temperature, and ill-considered or uncomfortable furniture.¹⁷

In line with this, it is also important to note that not only indoor factors are of importance in a broader perspective. Outdoor design factors are of importance to prevent global threats, especially antagonistic threats and terror. By securing healthcare facilities' systems of electricity and water supplies, as well as securing the HVAC systems, attacks with CBR and/or biomaterial can be counteracted. Actions here may include protecting outdoor air intakes and vents, making it difficult to access the roofs of buildings and restricted access to storage and building services functions.¹⁸

To identify these hot-spots, or vulnerable places, seems like an important mission, especially since the majority of the respondents (90%) in our survey, believed that crime occurrences in healthcare settings will increase in a five-year period, and they state that they think that violence, cyberattacks and vandalism will increase, followed by antagonistic threats, unauthorized influence, and frauds. This result is probably due to societal changes here in Sweden, with a geographical closeness to the war in Ukraine, increase in mental health challenges, environmental impact of heat and flooding creates new

situation, demographical changes, as well as staff shortage with higher turnover in staffing. This broad spectrum of issues and uncertainty affects the physical context of healthcare.¹⁹

Understanding the respondents view on causes of crime and crime prevention

In our survey, we asked the respondents to state their view on causes of crime in healthcare settings. In the result four factors were pointed out as most important, namely:

- situations which escalated to encounters,
- effects of the nearby area,
- the specialization of the ward,
- and the design of the ward/facility

These results go in line with previous research on the surface, but in a more specific analysis, we could also see how and then design seemed of importance in crime causation. Design (e.g. poor design) were mentioned specifically in relation to three crime types. These were *violence* and *vandalism* (including arson) which were explained by poor design in combination with social factors connected to the healthcare organization and mission (internal factors) and *theft* was explained by poor design in combination surrounding factors outside the healthcare sector (external factors).

This, in turn, indicates that healthcare settings both generate and attract crime events, and truly is a risky facility,²⁰ where a systematic crime preventive work needs to be conducted. According to the result of the survey, the crime preventive work today concerns securing the facility (alarms, locks and CCTV), personal alarms, guardians and information towards employees, which goes in line with traditional situational crime prevention (SCP).²¹ SCP in praxis, are measurements which aim to; increase the effort to commit crime, increase the risks for offenders, reducing the rewards of committing crime, removing excuses of crime and reducing provocations to commit crime.²²

Only a few respondents used design solutions, such as re-location or rebuilding of wards as a preventive measurement today, but, at the same time the vast number of respondents stated that the most important crime preventive measurement is to actually work with the building and the design of it. Especially by investing resources in early stages such as conceptual and design phases which goes in line with the CPTED-tradition.

CPTED FOR HEALTHCARE FACILITIES

As seen both in previous research and in the conducted survey, healthcare facilities are not only a place for healing and care, but it is also a crime scene for a variety of crimes, all from expressive crimes, such as violence to instrumental crimes such as property crime, theft and vandalism. In addition, societal changes, and a more unsafe world also creates the risk that healthcare facilities become targets in terroristattacks or cyber-attacks. Of course, the crime causation and factors influencing crime occurrence are often an intersect between individual-, organizational- and spatial conditions, which highlight the importance of a conjoint preventive work, in which CPTED can be one effective way to work.

In short, CPTED is a proactive strategy, where design of environments is used to increase the perception of safety and discourage from crime initiation and involvement.²³ It is based on the analysis of human/environment interaction and in-depth analysis of how the design decisions can facilitate or discourage crimes, by understand the intersect and the interaction between geographical location, vulnerable places (or hot spots), layouts, interior and risky situations.²⁴ As seen in both our survey and previous research, place seems to matter, and crime tend to cluster in specific locations. This also means that it is possible to work with certain places applying a more crime preventive approach in an early stage based on the CPTED-strategies.

CPTED and the use of CPTED-strategies are mainly connected to urban design and the development of residential areas by promoting sightlines, natural surveillance, visibility, access control, territoriality and working with image and milieu.²⁵ But, there has also been developed CPTED-strategies for health care facilities, especially hospitals, with an understanding for healthcare settings organization and work conditions, which can be fruitful to develop further.

According to York and McAlister (2015), CPTED for healthcare facilities, should involve certain design decisions and questions to discuss in an early stage, for example:

- Access control: how should staff, patients and visitors get (or deny) access to the different locations in the facility?
- How can natural surveillance and sightlines be created to increase the visibility (“eyes on the street”-principal)?
- How it is possible to create a sense of ownership and reduce the degree of anonymity?
- How can we design qualitative environments, which are easy to maintain?
- Where is physical protection, in terms of alarms, CCTV etcetera necessary?²⁶

All these questions also address an important criminological notion, namely that crime is depending on three requirements, namely a motivated offender, a suitable target and a lack of capable guardians, where guardians can be understood as different forms of social control (from police, security staff to CCTV and higher flows of people)²⁷ and that design can promote and facilitate a capable guardianship. A capable guardianship can take many forms, and can be creative, such as designing an entrance which allows separation of flows of patients, visitors and staff to the ER to avoid verbal or violent encounters. Or to discourage theft with different access control systems, all from entrance systems to medical cabinet systems as well as through visibility and social interaction in general. Violence can be interrupted at an early stage with good sightlines and social control mechanisms made possible via café's, corridors etcetera.

CONCLUSION: FINDING THE BALANCE IN PREVENTION

Healthcare is a part of our everyday life, as is e.g. celebrations, work, family life and as we also know - crime. Healthcare is also a societal infrastructure exposed to all processes of our society, today more so than before. The facilities sometimes represent a political standpoint, e.g. location of maternity wards and abortion clinics. At the same time as healthcare is becoming more developed and precise we also encounter societal challenges that also put strain on healthcare resources. It is therefore not possible to view the healthcare facilities and the activities being done there in a neutral and simplified way.

This paper focuses on the level of occurrence and type of crime in healthcare settings, more specifically the facilities where healthcare is executed – the place where we meet healthcare. Our data and previous research imply that the hospitals have become a crime scene for many different crimes. Violence, thefts, drugs, and minor crime is already present in healthcare and there seems to be an increased risk for new crimes, such as antagonistic threats and cybercrimes. Instead of securing and surveilling without reflection, we need to find a sustainable approach to prevention. Healthcare environments must be designed to counteract a large variety of crimes for us to be able to keep the open systems, if not the hospitals will have to be surveilled and controlled to such an extent that an open healthcare system will not be possible – challenging the very idea of care and compassion.

NOTES

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EXPLORING THE APPLICATION OF AI IMAGE GENERATORS IN PARTICIPATORY URBAN DESIGN

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INTRODUCTION

The development of AI-related websites and software applications reached an unprecedented peak in 2022, with the ChatGPT chatbot accumulating over 100 million users within two months. Additionally, attention from the public has been drawn towards models like DALL-E, Midjourney, and Stable Diffusion, which generate images from texts. By inputting precise keyword texts (prompts) into the model's servers, AI generates corresponding images. Moreover, there are virtually no limitations on the types of images that can be produced, giving rise to a new field known as Prompt Engineering.¹

In addition to the original text-to-image functionality, the derived functions of AI image generators, as summarized in this study, include style imitation drawing, special effect text, recoloring, 3D image conversion, generative fill, image extension, and image quality restoration. A significant amount of manual manipulation of images that previously required software like Photoshop can now be performed semi-automatically or fully automatically through AI. Consequently, it can be anticipated that AI image generators is already causing impacts in industries related to existing flat images and visual media. Moreover, the implications are beginning to extend across disciplines. For instance, the participatory urban design explored in this study is just one aspect influenced by the generative fill function.

The generative fill function, through selecting and repairing parts of the original image that users wish to remove, generates seamlessly fitting scenes, and can also be driven by prompts to regenerate missing parts. It supports adding objects desired by users into the fill, and the resulting visual is almost entirely plausible.² This function serves as a new tool for rapidly presenting design ideas in participatory urban design. Unlike the lengthy and tedious process previously required between collecting owner opinions and modifying designs for a project, the emergence of the generative fill function, while not completely replacing designers' provision of design ideas, provides an immediate preview of the design's preliminary effects. This enables non-professionals to have a clearer understanding of the imagined design, reduces disparities between verbal and visual expressions, significantly shortens the time and steps required for designers and owners to exchange opinions, demonstrating the practicality and future potential of AI image generators in communication between the public and professionals.

While the generative fill function is convenient and has already been successfully implemented in practical business by planning and design companies (such as UrbanistAI) using Stable Diffusion as a framework, this study found that although the function can compensate for some shortcomings in participatory planning, the lack of professional knowledge in AI may still lead to outcomes from AI image generators that do not meet the expectations of professionals and hinder effective communication

between the public and professionals. With the gradual improvement of future databases, it is believed that the practicality of AI-generated images will increase as they undergo continuous deep learning. However, this study argues that when AI image generators are used in executing participatory urban design, whether it is the input images awaiting correction or the modified output images, they currently only meet the criteria of visual plausibility,³ but may not necessarily possess the correctness of the aforementioned professional urban design. Specifically, non-professional participants, such as public, lack references to criteria for public space design in the city, such as Urban Design Qualities⁴ and walkability indicators,⁵ when using AI image generators. Therefore, this study attempts to adjust the usage of AI image generators from the perspective of professionals combined with general users, aiming to help future operators and developers of AI image generators understand how to apply and filter existing urban design standards in flat streetscape pictures. This ensures smoother processes and software for future participatory planning, aligning better with the needs of simulation design and actual construction, maintaining professional standards while satisfying public participation in the design process, enhancing technical efficiency and knowledge dissemination, and ultimately providing momentum for the development of related industries in architecture and urban design. As the AI trend drives progress across industries, providing improvement directions for image generation in future AI image generators aims to make the execution process of participatory urban design more efficient in practice, reducing the time designers spend digesting and improving AI-generated information.

PURPOSE

Architecture and urban design have always been interdisciplinary fields, encompassing a multitude of subjects. Factors to consider in the design process include not only individual creativity, culture, geography, human behavior, structure, regulations, and even philosophy, but also the integration of the latest architectural technology and software applications of the era. This integration aims to achieve the designer's goal of expressing ideas and meeting user needs perfectly within the constraints of reality. Therefore, whenever new technological innovations emerge, designers also aspire for their creations to remain contemporary, either by aligning with the demands of the time or by showcasing personal breakthroughs in design across eras. At the same time, it is essential to incorporate user needs and ideas. Only through such integration can the field of architecture and urban design continue to progress without disconnect from practice.

As the latest tool for creating and presenting images and visuals, AI image generators has naturally been integrated into many existing workflows. In the field of architecture and urban design, its primary role lies in providing initial design suggestions to designers. It can rapidly generate AI-simulated images, allowing designers to gain a preliminary understanding of the potential direction of a project. However, given the current state of AI development, it ultimately serves only as an auxiliary tool in design. Subsequent digestion and improvement by designers are still necessary to meet practical needs effectively.

Given this, this study has three main purposes:

1. Define the principles of visibility for streetscape images integrated into AI image generators to ensure the integrity of the information required for simulation design.
2. Enable AI image generators to possess professional knowledge and incorporate user ideas during the execution of participatory urban design processes.
3. Construct an urban design system suitable for AI participatory design, serving as a reference for the future application and development of AI tools.

LITERATURE REVIEW

The Conditions Involved in the Image in AI

The integrity of spatial and landscape information in urban areas is compressed when conveyed through the transition of media to 2D streetscape images, resulting in the elimination of many characteristics that can be presented in 3D space. Unlike 3D models and videos, photos contain less information due to the lack of depth information. Therefore, in the entire process of participatory urban design, the selection of streetscape images will affect whether the ideas of the design can be accurately expressed when integrating AI. Thus, the specific information included in the scene, as well as how clearing and generation are performed, will all affect how to maximize the effectiveness of AI image generators in a participatory design project.

Typically, a streetscape perspective is framed by building facades, which form the spatial framework. The number and location of intersecting streets determine the openness or enclosed nature of the area.⁶ The number of openings on building facades affects the visual interest of the area and the degree of activity of users on the streets.⁷ Adjacent to the building facades is the street space, which includes sidewalks, roads, street furniture, and various landscape elements. The presence of these elements not only represents the physical conditions of an urban area but also has a close relationship with user behavior and perception in that environment. However, the scope of only one streetscape image cannot encompass all these elements, which underscores the challenges of 2D display media as mentioned above.

In terms of the most intuitive and profound psychological experiences related to the visual quality of street spaces, openness and enclosure are the most significant, displaying a strong negative correlation. Both are influenced by key visual elements such as the height of tree canopies, alignment details of building facades, the width of horizontal roads, and visual obstructions from small obstacles, visual obstructions may also affect the proportion of the sky in streetscape images.⁸ In addition to the physical factors in the environment, common user behaviors in the area are also essential observations to record. An urban design project is always constructed for people; if it cannot align with existing activities or potential behaviors on the site, it will not be favored by users and may even cause inconvenience. All of the above information collectively constitutes the basic conditions that streetscape images must possess, forming the "principle of visibility" defined in this study. This principle will influence the completeness of environmental information in the image after integration into AI image generators, ensuring that the design process considers all affected aspects. Within the limited scope of images, every interconnected part of the urban environment can be observed.

The following Table will use actual streetscape images to provide illustrative examples and analysis based on the aforementioned principles and conditions of visibility:



Better Visibility	Worse Visibility
	
<ul style="list-style-type: none"> • both sided and easily observable facades • intersecting roads • street objects • sky • user behavior 	<ul style="list-style-type: none"> • street objects • user behavior <p>Lack:</p> <ul style="list-style-type: none"> • both sided and easily observable facades • intersecting roads • sky

Table 1. Differences in Visibility Advantages and Disadvantages

Urban Design Qualities Discussion

In integrating AI image generators into participatory urban design as a means of communication with non-professionals, the aim is to make the design process more efficient while creating works that meet both professional standards and user requirements. However, this study found in the operational process of UrbanistAI company that with the current AI image generators they employ, users simply propose subjective design ideas for urban design modifications and leave it to AI to generate randomly. Thus, determining what kind of space to plan in the urban area only requires instructing AI with corresponding physical environmental elements, such as various types of parks, streets, vendors, green belts, etc. AI will automatically generate new designs seamlessly integrated with the original image without any discrepancy. In other words, AI image generators directly generates the design results after various discussions, without automatically incorporating the perspectives of professionals (which need to be evaluated through discussions with professionals) to assess how the design would affect the qualities of urban environments and what perceptual changes it would bring to the original urban area. Consequently, whether the design results possess relevant professional knowledge remains a key factor influencing the quality of the design.

In summary, this study suggests that AI image generators should establish a system derived from Urban Design Qualities, assisting users in referencing and discussing, enabling AI image generators to approach design from a relatively objective and professional perspective. Urban Design Qualities is a list of 8 abstract perceptual qualities distilled from 51 mentioned in various literature sources by experts in fields such as architecture, landscape architecture, urban planning, and environmental psychology. These qualities include Imageability, Legibility, Enclosure, Human scale, Transparency, Linkage, Complexity, and Coherence. They are used to objectively assess the quality of the urban physical environment, covering the most important public spaces in the city "streets" and their edge Physical features, which influence user perception in urban areas and have a certain degree of correlation with pedestrian behavior, ultimately directly or indirectly interfering with walkability.⁹ Walkability affects people's efforts to create pedestrian-friendly places, measure environmental walkability, and assess the

costs and benefits of creating pedestrian-friendly environments, involving issues related to community environments and the perceptual outcomes of walking.¹⁰ Therefore, the importance of Urban Design Qualities in shaping urban environments is evident. If integrated into AI image generators, it would provide users and developers of AI tools related to participatory urban design with a professional perspective when inputting keywords in the "Prompt" text, facilitating smoother communication and collaboration between professionals and non-professionals using AI as a medium and ensuring that the designs produced by AI better meet practical needs.

RATIONALE

Urban Design Qualities are assessed based on user perception to evaluate the different impacts of Imageability, Legibility, Enclosure, Human scale, Transparency, Linkage, Complexity, and Coherence on the urban physical environment. These qualities are each composed of various Physical features and have been attempted to be translated from highly subjective definitions in urban quality to operational definitions based on their importance in urban quality by Reid Ewing and several experts from related fields.¹¹ They can assist designers in distinguishing the quality of designs based on objective and professional data, which is crucial for the sustainability, livability, and attractiveness of cities.

The application of AI image generators lowers the barrier for non-professionals to engage with urban design. However, due to their lack of correct design concepts, this study attempts to integrate Urban Design Qualities and Physical features into AI image generators to assist users and link them with Kevin Lynch's "The Image of the City." This aims to address the drawback of Physical features being overly complex and disconnected from users' lived experiences. By doing so, users can better operate and reference these tools, allowing this urban design system to balance professionalism and convenience in AI applications. Additionally, since "The Image of the City" does not exist independently within urban areas but rather forms a unified whole, using it as a classification standard helps prevent the loss of holistic integrity among the various Physical features post-classification.

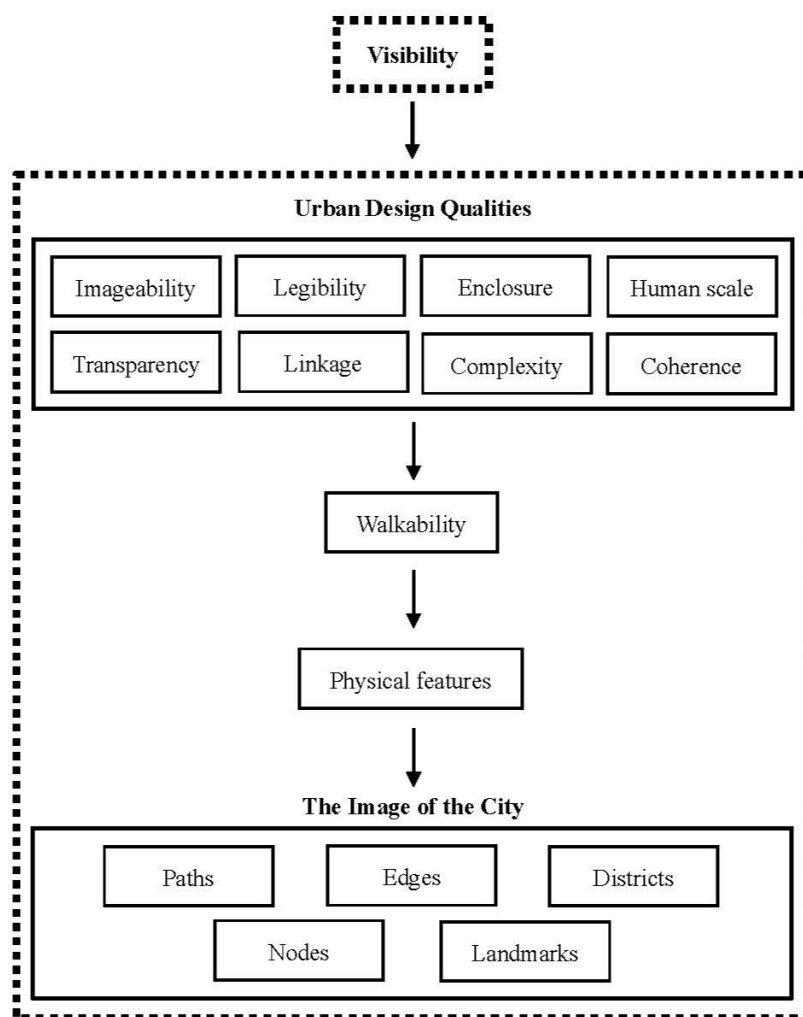


Figure 1. The Structure of Urban Design Qualities and its Associated Indicators

PROCEDURE

This study aims to integrate the theoretical literature mentioned above into the process of participatory urban design using AI image generators. Firstly, image selection is conducted based on the visibility principles mentioned above. However, due to the almost unlimited categories derived from different classification methods for public spaces,¹² the research mainly focuses on urban street spaces, which are commonly involved in urban surveys and fall within the scope of Isovist analysis as found in the reference literature reviewed for this study.

The operation of AI image generators in Generative fill can be broadly divided into two main processes: clearing and generation. Users need to mark the parts of the image they want to modify, and then AI will regenerate a new scene that seamlessly integrates with the surrounding landscape. In practical terms, in order to collect information more extensively and inclusively, provide planning direction for designs, and promptly respond to users' actual needs, thus increasing community acceptance and leveraging the operational advantages of participatory urban design,¹³ this study will prioritize user requirements when operating AI tools to generate designs. Subsequently, Urban Design Qualities of the generated designs will be compared by AI against the before and after modifications, using the standards outlined in the book "Measuring Urban Design." The best solution will be determined through iterative

discussions with professionals. However, evaluating Urban Design Quality does not necessarily determine the "superiority" or "inferiority" of a design. It simply indicates the extent to which these design changes will affect people's perceptions, providing users with a professional perspective reference against their needs.

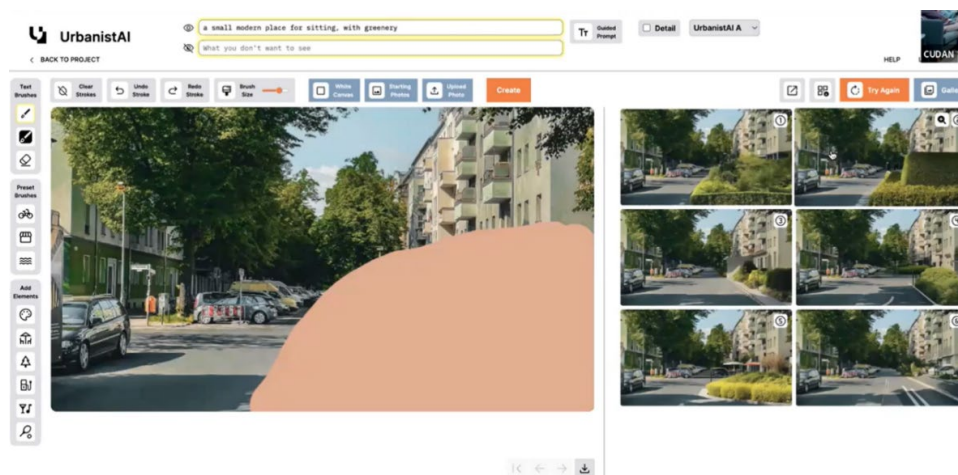


Figure 2. Example of Generative fill from UrbanistAI.¹⁴

Reproduced from: CUDANLab. "Damiano Cerrone (UrbanistAI): participatory urban planning," YouTube, October 3, 2023

As Urban Design Quality is based on the regional urban environment and not all Physical features can be defined, modified, and visualized in practice, to make the public's participation in urban design with AI more intuitive while incorporating a professional perspective, this study will organize and classify the Physical features encompassed by each Urban Design Quality according to Paths, Edges, Districts, Nodes, Landmarks.¹⁵ This classification aims to align as closely as possible with the public image in the minds of most urban residents. The following are the classification criteria divided by this study after integrating Kevin Lynch's definition:

1. Paths: All circulation routes and their associated objects (e.g., traffic accessories used for signage, aesthetics, or safety on roads).
2. Edges: Street edges and building facades.
3. Districts: Open public spaces and specific activity areas (perceived distinctions between interior and exterior areas).
4. Nodes: Gathering points for crowds.
5. Landmarks: Iconic objects used for location and understanding of territorial structures.
6. Others: Landscapes, street furnitures, activities, etc.

In the study, to achieve a more accurate definition of Physical features, the Copilot tool from SciSpace website was utilized, along with collaborative efforts between researchers, to organize the literature, thereby reducing the error rate associated with manual literature review.

Urban Design Qualities	The Image of the City	Physical features	Interpretations
Imageability <i>The quality of urban environments can be easily recognized, remembered, and imagined. It refers to the visual features and memorable characteristics of a place.</i>	Edges	proportion of historic building frontage	
		number of buildings with identifiers	
		number of dominant building colors	
		number/proportion of buildings with non-rectangular silhouettes	
	Districts	courtyards/plazas/parks	
		major landscape features	natural elements or carefully designed green spaces
	Nodes	memorable architecture	
	Landmarks	landmarks	
		distinctive signage	
		public art	
		billboards	
	Others	pedestrians moving	
		terminated vista	memorable scenery
	stationary people standing		
	people seated		
	outdoor dining		
Legibility <i>People can easily understand and navigate in urban environments. It involves clear and consistent visual cues, such as signs and landmarks, to help individuals orient themselves and find their way.</i>	Paths	street connections to elsewhere	the convenience of movement and connectivity between streets and other areas
	Edges	number of buildings with identifiers	
	Districts	major landscape features	
	Nodes	memorable architecture	
	Landmarks	landmarks	
		distinctive signage	
		public art	
		place/building/business signs	
		directional signage	
	Others	long sight lines	extensiveness of vision
		terminated vista	
	common tree spacing and type		
Enclosure <i>The degree of enclosure and sense of protection</i>	Paths	street width	
		proportion of street with parked cars	

provided by the urban environment. Influenced by the layout and design of buildings, streets, and public spaces, it creates a sense of enclosure or openness.

	Edges	proportion of sidewalk shaded by trees	
		pedestrian scale street lights	
		arcade	
		awnings or overhangs	
		proportion street wall	
		enclosed sides	Indicates the degree to which streets and public spaces are visually closed or defined by buildings, walls, or other vertical elements. The maximum number of enclosed sides is three, including the front, same side, and opposite side of the street.
		common setbacks	
		building height	
		common building heights	
Districts	courtyards/plazas/parks		
	building height to street width ratio	from 1:2 to 3:2, or as low as 1:6	
Others	long sight lines		
	terminated vista		
	number of trees		
	sky ahead	forward visual proportion	
	buildings ahead		
	landscaping ahead		
	sky across	opposite visual proportion	
	buildings across		
	landscaping across		
Human scale <i>Urban design related to the human body and its perception. Involves creating proportions and comfortable spaces and elements suitable for human use, promoting</i>	Paths	progress toward next intersection	
		street width	
		median width	
		sidewalk clear width	
		buffer width	road buffer zone
		textured sidewalk	different from the material of the roadway

<i>feelings of intimacy and connection.</i>	textured street		
	proportion of street with parked cars		
	curb extensions	road verge expansion	
	midblock crossings	crosswalks not placed at intersections	
	midblock passageways		
	landscaped median		
	pedestrian scale street lights		
	Edges	arcade	
		visible sets of doors	
		proportion first floor facade with windows	
		proportion entire facade with windows	
		awnings or overhangs	
		building height	
		billboards	
	Districts	proportion active uses	Promoting the vitality and human scale of the street. (e.g., shops or cafes)
		building height to width ratio	
	Nodes		
	Landmarks	public art	
	Others	long sight lines	
		terminated vista	
		proportion of distance walked versus	
		distance visible	
		moving cars	
		traffic to street width ratio	proportion of traffic flow to road width
		moving cyclists	
number of trees			
trees in wells or landscaped beds			
large planters without trees			
small planters			
pedestrians moving			
stationary people standing			
people seated			

		outdoor dining
		tables
		seats
		other street furniture
		miscellaneous street items
Transparency <i>The degree to which the urban environment allows visual connections and interactions between different spaces and elements. It involves the use of transparent materials, open facades, and unobstructed views to enhance social and visual connectivity.</i>	Paths	sidewalk width
		midblock passageways
	Edges	arcade
		visible sets of doors
		proportion first floor facade with windows
		proportion entire facade with windows
		proportion street wall
		average building setback
		building height
	Districts	courtyards/plazas/parks
		proportion active uses
	Others	people seated
		outdoor dining
	Linkage <i>The physical and visual connections between different parts of the urban environment. This includes pathways, streets, and bridges suitable for pedestrians to facilitate movement and transportation convenience.</i>	Paths
		street connections to elsewhere
		street width
		textured sidewalk
		textured street
		curb extensions
		midblock crossings
		midblock passageways
		landscaped median
Edges		arcade
		visible sets of doors
		awnings or overhangs
		common architectural style
		common building heights
		proportion of counted sets of doors that are recessed
Landmarks		common signage
Others		long sight lines
		terminated vista
		proportion of distance walked versus
		distance visible
	moving cars	
	common tree spacing and type	
	outdoor dining	

Complexity

The richness and diversity of the urban environment, including its architectural styles, building heights, and mix of land uses. It generates interest and stimulation, encouraging exploration and engagement.

Paths	number of accent colors
	number of paving materials
	textured sidewalk
	textured street
	curb extensions
	midblock crossings
	midblock passageways
	landscaped median
	pedestrian scale street lights
	traffic signs
Edges	number of buildings
	various building ages
	number of primary building materials
	number of dominant building colors
	visible sets of doors
	awnings or overhangs
	number of buildings with non-rectangular silhouettes
Districts	courtyards/plazas/parks
	proportion active uses
Nodes	
Landmarks	public art
	place/building/business signs
	directional signage
	billboards
	graffiti
Others	number of land uses
	building projections
	parked cars
	moving cars
	moving cyclists
	number of landscape elements
	number of trees
	trees in wells or landscaped beds
	large planters without trees
	small planters
	pedestrians moving
	stationary people standing
	people seated
	outdoor dining
	tables
	seats
	other street furniture
	miscellaneous street items

Coherence <i>The overall unity and harmony in the urban environment. It involves the integration of different elements and features to create a cohesive, visually pleasing whole.</i>	Paths	number of paving materials
		pedestrian scale street lights
		traffic signs
	Edges	various building ages
		number of primary building materials
		number of dominant building colors
		common window proportions
		common architectural style
		common setbacks
		common building heights
	Landmarks	place/building/business signs
		common signage
	Others	number of accent colors
		common materials
		common tree spacing and type
pedestrians moving		
other street furniture		
Lack of visibility or inability to be manipulated in AI tools	maximum ahead	
	maximum across	
	height interruptions	
	noise level	
	speed	
	building projections	
	overhead utilities	
	common building masses	

Table 2. Urban Design Qualities and Physical features Applied Categorisation¹⁶

Source: Table adapted from Ewing et al. (2013).

This study organizes the Physical features related to Urban Design Qualities according to the standards set by The Image of the City, addressing the previously complex and challenging aspects of Physical features. As a result, the integration of professional indicators into AI image generators becomes easier for users to comprehend and more convenient to apply. The operational process is as follows:

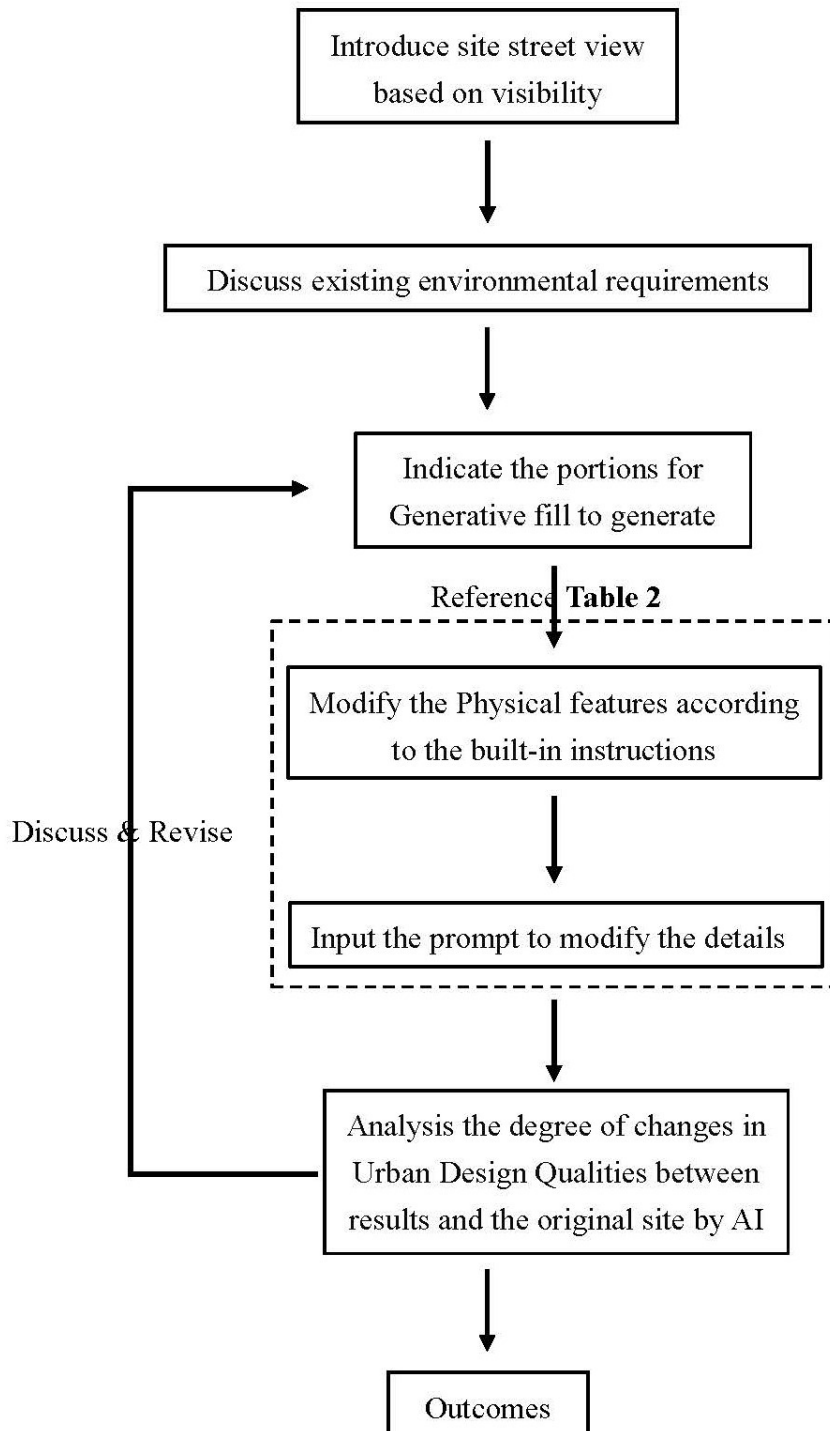


Figure 3. AI Imagery Generator in Participatory Urban Design Workflow

CONCLUSION

This study aims to address the challenges currently faced in operating AI-participatory urban design, including the issues of "introducing visibility into streetscapes" and "lack of professional logic in AI-generated designs. " It proposes conditions for assessing visibility levels to ensure the integrity of information when 2D media is introduced into AI image generators. It also emphasizes the importance of continuity and integrity of Physical features in shaping the urban environment and public perception,

while linking them to The Image of the City for classification. This forms a systematic approach for users to execute AI participatory urban design, providing a reference for the development and use of AI tools. This ensures that Generative fill is not merely a simple image stitching tool, lowers the threshold for public use of AI image generators, and incorporates certain professional requirements and logic, reducing the cognitive gap between the public and professionals in the participatory design process caused by differences in professional knowledge. Ultimately, this strengthens the role of AI in practical applications.

NOTES

- ¹ Laria Reynolds and Kyle McDonell, "Prompt Programming for Large Language Models: Beyond the Few-Shot Paradigm," in *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems* (2021), 4, doi:10.1145/3411763.3451760.
- ² Tripti Shukla, Paridhi Maheshwari, Rajhans Singh, Ankita Shukla, Kuldeep Kulkarni, and Pavan Turaga, "Scene Graph Driven Text-Prompt Generation for Image Inpainting," in *2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, Vancouver, BC, Canada, 2023, 759-768, doi:10.1109/CVPRW59228.2023.00083.
- ³ Shukla et al., "Scene Graph Driven Text-Prompt Generation," 761.
- ⁴ Reid Ewing and Susan L. Handy, "Measuring the Unmeasurable: Urban Design Qualities Related to Walkability," *Journal of Urban Design* 14 (2009): 65-84, doi:10.1080/13574800802451155.
- ⁵ Ann Forsyth, "What is a Walkable Place? The Walkability Debate in Urban Design," *URBAN DESIGN International* 20 (2015): 274-292, doi:10.1057/udi.2015.22.
- ⁶ Norhayati Mahyuddin, "Achieving Continuity and Consistency in Urban Environments: The Importance of Building Attributes and Street Elements," 2013; Rob Krier, *Urban Space* (New York: Rizzoli, 1979).
- ⁷ Stephen Law, Chanuki Illushka Seresinhe, Yao Shen, and Mario Gutiérrez-Roig, "Street-Frontage-Net: Urban Image Classification Using Deep Convolutional Neural Networks," *International Journal of Geographical Information Science* 34, no. 4 (2018): 681-707, doi:10.1080/13658816.2018.1555832.
- ⁸ Xiangyuan Ma et al., "Measuring Human Perceptions of Streetscapes to Better Inform Urban Renewal: A Perspective of Scene Semantic Parsing," *Cities* 110 (2021): 103086, doi:10.1016/J.CITIES.2020.103086.
- ⁹ Reid Ewing et al., "Identifying and Measuring Urban Design Qualities Related to Walkability," *Journal of Physical Activity & Health* 3, no. s1 (2006): S223-S240, doi:10.1123/jpah.3.s1.s223.
- ¹⁰ Forsyth, "What is a Walkable Place?" 275.
- ¹¹ Reid Ewing et al., "Measuring Urban Design: Metrics for Livable Places," *Measuring Urban Design* (2013): n. pag., doi:10.5822/978-1-61091-209-9.
- ¹² Abdulaziz Alzahrani, "Classification of Urban Spaces: An Attempt to Classify Al-Baha City Urban Spaces Using Carmona's Classification," *SAGE Open* 12 (2022): n. pag., doi:10.1177/21582440221097892.
- ¹³ Marcus Foth, "Participation, Co-Creation, and Public Space," (2017), doi:10.5204/JPS.V2I4.139.
- ¹⁴ CUDANLab. "Damiano Cerrone (UrbanistAI): participatory urban planning," *YouTube*, October 3, 2023, 1:45:38, <https://www.youtube.com/watch?v=utHeTXkaI9A>, 1:22:55.
- ¹⁵ Kevin M. Lynch, *The Image of the City* (1960), doi:10.2307/427643.
- ¹⁶ Ewing et al., "Measuring Urban Design," n. pag; Lynch, *The Image of the City*.

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URBAN SPACE(S) FOR YOUNG PEOPLE: A FOCUS FOR RESILIENT AND SUSTAINABLE CITIES

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INTRODUCTION

In March 2020, Zurich's cityscape witnessed a profound transformation. The usual posters advertising parties, demonstrations, and art exhibitions were replaced by an eye-catching blue poster bearing the plea, " Stay at home. Please. Everyone". This shift dramatically altered how young people structured their daily lives and engaged with urban spaces. The abrupt enforcement of restrictions to mitigate the spread of the virus redefined the urban landscape: educational institutions transitioned to online platforms, recreational facilities and common gathering spots shuttered, necessitating the creation of new experiential spaces, and the reconfiguration or invention of routines and social practices.

This paper and the corresponding research project *Youth and Space*¹ concentrate on exploring the extent to which young individuals utilized urban spaces to navigate the crisis and the degree to which these spaces were essential for fostering and preserving their resilience. This analysis aims to identify requirements for socially sustainable urban development.

The Covid-19 pandemic provides a critical lens for examining the three dimensions of social resilience² among Zurich's youth and urban spaces: the response of young people to spatial constraints, the long-term adaptive strategies they developed, and the emergent transformative capacities that could enhance urban resilience against future crises.

Consequently, the subsequent chapter presents the significance of urban spaces in the experiences of youth whilst growing up, alongside a discussion on the concepts of resilience and social sustainability. This is followed by preliminary findings from our research, detailing how young people navigated the restrictions imposed during the pandemic. These outcomes are then analyzed through the lenses of spatial theory, appropriation, and resilience to articulate requirements for socially sustainable urban development.

THEORETICAL CONTEXTUALIZATION

Spatial constitution and use of space by young people

The appropriation, shaping, and creation of social spaces are pivotal in young people's interactions with their environments.³ Such spaces are essential, providing arenas for experience, retreat, and freedom that facilitate the expansion of their agency and processes of independence, discovery, and experimentation.⁴ Space is understood as relational and as a product of societal and social action,⁵ and is constructed socially through the processes of spacing—placement within places—and synthesis—the mental integration with surrounding built and social structures.⁶

These processes of appropriation are characterized by prevailing power relations⁷ in which young people are hardly taken into account. The atmospheres of places⁸ and their symbolic contents⁹ also shape the potential uses and appropriations. According to Rolshoven,¹⁰ space is constituted by three aspects: the built space, the experienced space, and the representational space, which are - following Lefebvre¹¹ - simultaneously effective as space-constituting elements. In this regard, the concept of social space is crucial, transcending physical-local limitations to encompass a network of social structures and practices.¹² Reutlinger and Wigger¹³ suggest that the design of these social spaces can occur not only at the material level but also through governance, organizational strategies, and direct work with people.

Nowadays, young people are seldom included in urban development or decision-making processes concerning the design and utilization of urban spaces.¹⁴ While the importance of addressing young people's needs in these processes is recognized, their inclusion is frequently mediated through experts due to the high costs associated with participatory processes, often omitting the direct perspectives of the youth themselves. Moreover, places of nonspecific purpose and free from consumer pressures, which hold particular importance for youth, are increasingly lost to entrepreneurial urban development policies.¹⁵ During the pandemic, the already precarious balance of power regarding the use of space shifted once again to the disadvantage of young people, as their needs were sidelined by political decisions aimed at protecting other vulnerable groups. Spaces previously accessible to young people were closed, opportunities for contact were restricted, and their usual gathering places were subject to heightened police surveillance.

Social sustainability and resilience

Social sustainability refers to developing structures, systems and practices that are designed to meet the needs of the present generation without jeopardizing the capability of future generations to fulfil their own needs.¹⁶ The objective here is to guarantee an equitable distribution of resources and opportunities, ensuring a high quality of life for all societal members. This approach necessitates an appropriate and forward-thinking response to crises. This is reflected in the concept of resilience, which emphasizes the ability of individuals or communities to recover effectively from setbacks and adapt to change. According to Keck & Sakdapolrak,¹⁷ there are three dimensions of social resilience:

- Coping capacities involve the ability to manage and overcome immediate adversities through tactical and short-term responses.
- Adaptive capacities focus on learning from past experiences and adapt to new challenges through long-term adjustments and improvements.
- Transformative (participatory) capacities encompass the ability to innovate and reform institutions to enhance societal well-being and resilience, thereby fostering sustainable development and bolstering resilience against future crises.

The constraints imposed on the usability of urban spaces during the pandemic have demanded considerable resilience from young people across all three dimensions. The exploration of new experiential spaces and the innovative social practices that many young people have adopted are testament to their resilience, showcasing their ability to navigate and adapt to these complex challenges.

EMPIRICAL FINDINGS

In the project, workshops were conducted in small groups employing diverse methods – including memory tasks with narrative stimuli, pin on maps method, video recording, and mental mapping – with twelve classes across various educational levels and vocational backgrounds, engaging nearly 230 young individuals in total. The analysis was conducted using the Grounded Theory methodology.¹⁸ So far, the data from approximately 70 participants have been openly coded, reaching a level of saturation

concerning the emergence of new codes. However, a comprehensive theory on the use of space by young people under pandemic conditions has yet to be developed. The following section presents the spectrum of how young people dealt with the pandemic restrictions regarding their use of space, illustrated through selected quotations. The discussion aims to culminate in a synthesis of observations on the qualities of urban spaces that are significant to young people.

Restrictions on the use of space by young people

In response to the pandemic, young people adapted their social behaviors by limiting their number of contacts. Additionally, they modified their use of space in various ways, such as retreating to private spaces with friends, withdrawing entirely from social life, or altering their use of public and semi-public spaces. These adaptations reflect a broader spectrum of strategies employed to navigate the social restrictions imposed during this period.

Deliberate disregard of the pandemic restrictions

Contrary to certain expectations, a rather small proportion of young people reported a deliberate disregard for the spatial pandemic restrictions.¹⁹ Some young people sought out spaces where like-minded young people could meet and had a similarly relaxed approach to the spatial restrictions:

«It was a bit restricted because of the number of people and places allowed. That's why I was often at the lake [...] because there were a lot of people there who didn't care that the corona pandemic was going on.» (male, born 2005)

While this statement indicates a deliberate disregard for the restrictions, other young people reported an attitude of bypassing them. This included utilizing closed spaces or the avoidance of areas under strict surveillance. Encounters with law enforcement were either described as an exciting game or merely minor annoyances that could be easily evaded:

«[I ended] the evening with a few friends [...] as long as there were no inspections [laughs]. And even then, we just sat apart for five minutes.» (female, born 2000)

Joint retreat to private spaces

Nevertheless, most young people adopted a more compliant approach. They retreated to private domains, such as visiting one another's homes, which provided them with a means to sustain social interactions without violating public space restrictions:

«Fortunately, my best friend is also my neighbour, so I was able to spend a lot of time with her during the lockdown. We chilled a lot together at home or in the garden.» (female, born 2008)

It is noteworthy that such practices were frequently mentioned by young individuals with a higher education background; the link between their social milieu and the spatial opportunities available at home is readily apparent.

Social withdrawal and isolation

During the pandemic, some young individuals reported that they rarely met anyone other than their family in their own household, spending most of their time isolated in their own apartments or rooms. There were, however, positive aspects to this social withdrawal:

« I thought it was a shame that you couldn't go into town or meet friends. But on the other hand, it was also positive because you had a break from the world and reality. You were in your own world and had time for yourself, to find yourself.» (female, born 2006)

For those young people who had limited social interactions even before the pandemic, little changed in their daily routines, yet they found themselves with an abundance of time:

«I must say, not much changed for me except for homeschooling. Everything else remained quite the same. [...] The advantage was that we didn't have to go anywhere. So there was a lot of time. More time because we didn't need to leave the house. [...] I was really only at home, and aside from occasional shopping trips to town, that was it.» (male, born 2004)

Additionally, some youths spent a significant portion of their time in virtual environments, where social interactions continued:

«I spend a lot of time online and do many things there [...] I'm just gonna write Computer [on the mental map]. I don't think it's bad. I meet friends there sometimes.» (male, born 2004)

Emerging opportunities and innovation

In addition to the aforementioned stresses and uncertainties, new opportunities arose. A significant aspect of this was the increase of free time available to nearly all young individuals, which they utilized for gaming, watching series, cooking, baking, reading, or learning new skills. This unleashed a wave of creative and innovative energy in some youths. Their experiences during this time stood in stark contrast to their previously structured and performance-oriented routines, which typically included a regimented schedule of schoolwork, studying, and structured leisure activities:

«I had a book and filled it with ideas and drawings while in the forest. We always kept the teachers on mute. My parents didn't even know I was supposed to be in school. I would have lunch until 2 pm. I've never been as productive in my life as I was during the lockdown.» (male, born 2007)

With the newfound free time and the crowded home environment due to family members constantly being present, some young people discovered the joy of being outdoors "without specific intent". Consequently, their immediate surroundings, neighborhoods, and nearby recreational areas gained increased significance:

«I was outside every day with my friends. My routine was sleep, school, outdoors. Every day. [...] I was outdoors more than usual, almost every day.» (male, born 2005)

Natural settings such as forests, previously seldom visited, became more frequented and significant:

«I went to the forest a lot, looking for alternatives because other places were closed. I always went out with the dog; that's how I managed to get outside. I never used to go out much, but I went out more during the pandemic.» (female, born 2007)

Meanwhile, other young individuals met in parking lots, for example, to go roller skating. With the need for covered areas, bus stops became pivotal gathering spots. Parking garages, linked with virtual spaces, also emerged as central experiential and open areas:

«We discovered a lot here, met friends we got to know through the 'Houseparty' app. We gathered here and spent our evenings here. You can be a bit louder here, it doesn't bother anyone; there are no apartments, just offices.» (male, born 2006)

Qualities and characteristics of the used spaces

Throughout the pandemic, it became evident that most young individuals experienced significant stress, particularly due to the imposed contact restrictions. Nonetheless, some young people found this period somewhat enriching.

The limited access to urban spaces proved to be a severe hardship, as these areas are crucial for various developmental activities. In exploring the essential characteristics and necessary qualities of such spaces, several patterns and preferences emerged across a diverse range of responses:

- Aspects such as seating, shelter from rain and cold, late-night accessibility, opportunities for shopping especially food, multipurpose utility, toilet facilities, and proximity to water were often mentioned as important characteristics and features of places to stay.

- More critical than physical features, however, were the social aspects and the potential for personalization of spaces. These included the ability to gather in large groups, engage in loud activities without disturbance, and opportunities to meet new people. Contrasting needs also surfaced, such as the desire for privacy, spaces for like-minded individuals, and natural settings.
- The ambiance of a place was also highlighted as vital. This included general appreciation for aesthetic and stimulating architecture, as well as specific praise for beautiful views, waterfront or rural locations, green spaces, tranquility, and spaciousness.
- The proximity to one's residence, centrality within the city, and accessibility (e.g., via public transport) were significant. On the other hand, places should be sufficiently remote or hidden from view to avoid social control.
- Places where conflicts are suspected were generally avoided.

The variety and preferences regarding the spaces utilized or avoided illustrate the broad spectrum of young people's needs. One important finding is that young people tend to come to terms with the existing conditions and modify their behaviors accordingly, rather than creatively altering spaces or vocally advocating for changes.

POTENTIAL FOR PROMOTING RESILIENCE AND A SOCIALLY SUSTAINABLE CITY

To derive initial recommendations for a socially sustainable and resilient city development, we conclude by summarizing the findings with regard to the three dimensions of resilience²⁰.

Coping capacities: The (re)design of social spaces

The abrupt emergence and unprecedented nature of the pandemic, alongside with its containment restrictions, necessitated a significant reorganization of social spaces by young people. Access to certain physical spaces was restricted, and traditional forms of peer interaction were disrupted. In response, young individuals often displayed considerable creativity in reshaping their social environments. Particularly in the initial phases of the pandemic, the novelty of the situation held a certain appeal, and the restrictions were more readily accepted under the assumption that they were temporary.

This transformation of social spaces was prompted by the actions of various stakeholders without altering the physical configuration of urban spaces. According to the model by Reutlinger and Wigger,²¹ the pandemic restrictions directly impacted the usability of the material world, functioning effectively as the "control system." Consequently, young people were forced to adjust to these restrictions. Similarly, organizations such as youth services, educational institutions, and law enforcement had to navigate these limitations while continuing to meet the changed needs of their target groups. Nonetheless, the capacity of young people to influence the design of new services was markedly constrained. As a result, while some short-term coping mechanisms eventually proved ineffective, young people developed and refined adaptive strategies over time.

Adaptive capacities: Re-constitution and appropriation of spaces

In the process of appropriating places, young people often used new places during the pandemic and thus changed their own experienced space, but also the experienced spaces of others. Although the alteration of (historical) meanings attributed to these places was not fundamentally successful due to prevailing power dynamics, such changes were often perceived by the young people themselves. Overall, it is evident that young people did not usually actively reshape the physical characteristics of their environments. They made do with what was available or used the places where they were tolerated and where they did not fear conflict. In some cases, the experiences of the pandemic led to enduring changes in the use of space, which were deemed beneficial for their resilience by the young individuals.

At first glance, the search for and adoption of new spaces when familiar ones become inaccessible may appear trivial. However, understanding appropriation as a process where space is created through the engagement with places and the interaction with both physical and predominantly social structures²² elucidates how existing power relations necessitate the search for new physical locations for certain experiential spaces. It is noteworthy that natural environments have gained significant importance for many young people, with locations such as forests or bodies of water being increasingly and deliberately sought after. Drawing from the model by Rolshoven,²³ the reconstitution of space in its three dimensions can be observed here: Places associated with rest, relaxation, and health are actively pursued, fostering the creation of new types of spaces that meet both pre-existing and emergent needs amid the crisis. This engagement confirms and generates new attributions to specific places, thereby permanently integrating them into the young people's social spaces.

Transformative capacities: Participation in planning and social sustainability

Amidst the changes in social spaces, many young people exhibited transformative capacities in their interactions with various stakeholders within urban settings. Our dialogues with young individuals revealed a keen interest in urban development and a desire to engage in discourse with experts. However, existing power dynamics and the relatively limited involvement of youth in ongoing developmental processes mean these transformative capabilities are often unrecognized and underutilized. For sustainable development, it is crucial to take the perspectives of young people seriously and actively involve them in urban planning processes. This necessitates mechanisms that address power imbalances and accommodate the diversity among young populations.

The theme of youth participation in the planning, implementation, and utilization of urban spaces will be a focal point in the subsequent phases of the project. Following interviews with a broad array of urban development professionals, it is planned to synthesize the insights gathered and discuss them with both young people and experts. Ultimately, strategies for needs-based youth participation and methods for their structural integration will be collaboratively developed. We believe that this approach will contribute to building a more socially sustainable and resilient city, which, in turn, enhances the resilience of young people, particularly in preparation for future crises.

NOTES

- ¹ The project is funded by the Swiss National Science Foundation as part of the national research program "Covid-19 in Society" and is carried out at the Institute for Institute of Diversity and Social Integration at the Zurich University of Applied Sciences. Duration from February 2023 to January 2026.
- ² Markus Keck and Patrick Sakdapolrak, "What Is Social Resilience? Lessons Learned and Ways Forward," *Erdkunde* 67, no. 1 (2013), <https://doi.org/10.3112/erdkunde.2013.01.02>.
- ³ Axel Pohl, "Praktiken Jugendlicher Im Öffentlichen Raum – Zwischen Abhängen Und Teilhabeansprüchen," in *Soziale Arbeit Ist Politisch: Biographische, Empirische Und Theoretische Reflexionen Mit Und Über Annegret Wigger*, ed. Christian Reutlinger and Eleni Spiroudis (Berlin: Frank & Timme, 2023).
- ⁴ Ulrich Deinert, "Aneignung Der Lebenswelt–Entwicklungsaufgabe Der Teenies," *Kurzfassung aus: Deinert, Ulrich (Hrsg.) Sozialräumliche Jugendarbeit. Grundlagen, Methoden, Praxiskonzepte 2* (2005).
- ⁵ Doreen Massey, "The Spatial Construction of Youth Cultures," in *Cool Cultures: Geographies of Youth Cultures*, ed. Tracey Skelton and Gill Valentine (London, New York: Routledge, 1998); Henri Lefebvre, "La Production De L'espace," *L'Homme et la société* 31, no. 1 (1974), accessed June 25, 2024, https://www.persee.fr/doc/homso_0018-4306_1974_num_31_1_1855.
- ⁶ Martina Löw, *Raumsoziologie*, Suhrkamp Taschenbuch Wissenschaft (Frankfurt am Main: Suhrkamp, 2001).
- ⁷ Pierre Bourdieu and Yvette Delsaut, *Sozialer Raum und Klassen;Leçon sur la leçon: Zwei Vorlesungen*, 4. Auflage, Suhrkamp Taschenbuch 500 (Frankfurt: Suhrkamp, 1985); Georg Simmel, "Über räumliche Projektionen sozialer Formen," in *Gesamtausgabe in 24 Bänden: Band 7: Aufsätze und Abhandlungen 1901-1908. Band I*, ed. Georg Simmel et al., 1st ed. (Berlin: Suhrkamp, 2017); Johanna Rolshoven, "Zwischen Den Dingen: Der Raum," *Schweizerisches Archiv für Volkskunde* 108 (2012), accessed March 25, 2024, https://static.uni-graz.at/fileadmin/_Persoenliche_Webseite/rolshoven_johanna/Dokumente/jr_raumverstaendnis.PDF.
- ⁸ Gernot Böhme, *Atmosphäre: Essays zur neuen Ästhetik*, Siebte, erweiterte und überarbeitete Auflage, 5. Auflage, Edition Suhrkamp (Berlin: Suhrkamp, 2022).
- ⁹ Bourdieu and Delsaut, *Sozialer Raum und Klassen;Leçon sur la leçon*.
- ¹⁰ Rolshoven, "Zwischen den Dingen: der Raum."
- ¹¹ Lefebvre, "La production de l'espace."
- ¹² Fabian Kessl and Christian Reutlinger, "(Sozial)Raum – ein Bestimmungsversuch," in *Sozialraum: Eine Einführung*, ed. Fabian Kessl and Christian Reutlinger (Wiesbaden: VS Verlag für Sozialwissenschaften, 2010), accessed October 17, 2023.
- ¹³ Christian Reutlinger and Annegret Wigger, *Transdisziplinäre Sozialraumarbeit: Grundlegungen und Perspektiven des St. Galler Modells zur Gestaltung des Sozialraums*, Transposition - Ostschweizer Beiträge zu Lehre, Forschung und Entwicklung in der Sozialen Arbeit Bd. 1 (Berlin: Frank & Timme, 2010), <https://ebookcentral.proquest.com/lib/kxp/detail.action?docID=3033790>.
- ¹⁴ Suzanne Vallance, Harvey C. Perkins, and Jennifer E. Dixon, "What Is Social Sustainability? A Clarification of Concepts," *Geoforum* 42, no. 3 (2011), <https://doi.org/10.1016/j.geoforum.2011.01.002>.
- ¹⁵ Sabine Knierbein, "Die Zeichen Stehen Auf Wandel: Öffentliche Räume Als Facettenreiches Politikfeld," *ÖGZ*, no. 02 (2022).
- ¹⁶ Antonie Schmitz and Lea M. Caminero, "Stadt Ermöglichen – Soziale Selektivität in Beteiligungsprozessen," in *Stadtgeographie*, ed. Yvonne Franz and Anke Strüver (Berlin, Heidelberg: Springer Berlin Heidelberg, 2022).
- ¹⁷ Keck and Sakdapolrak, "What is social resilience? Lessons learned and ways forward."
- ¹⁸ Barney G. Glaser and Anselm L. Strauss, "Discovery of Substantive Theory: A Basic Strategy Underlying Qualitative Research," *American Behavioral Scientist* 8, no. 6 (1965), accessed December 3, 2018, <https://doi.org/10.1177/000276426500800602>, <http://journals.sagepub.com/doi/10.1177/000276426500800602>.
- ¹⁹ At the same time, it must be acknowledged that there may have been a degree of reticence in the narratives shared with the researchers, coupled with an element of self-presentation in front of their peers who were present.
- ²⁰ Keck and Sakdapolrak, "What is social resilience? Lessons learned and ways forward."
- ²¹ Reutlinger and Wigger, *Transdisziplinäre Sozialraumarbeit*.
- ²² Sara Landolt, "Aneignung Und Eigensinn," in *Sozialraum: Eine Elementare Einführung*, ed. Fabian Kessl and Christian Reutlinger, Sozialraumforschung und Sozialraumarbeit (Wiesbaden: VS Verlag für Sozialwissenschaften, 2022), 20:195.
- ²³ Rolshoven, "Zwischen den Dingen: der Raum."

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RESILIENT CITIES: BUILDINGS, PEOPLE, AND RECIPROCAL INTERACTIONS

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INTRODUCTION

An increasingly urbanised world brings with it unique challenges, such as widening inequality, lack of sustainability, and vulnerability of populations.¹ These issues can be compounded by other problems facing our world, including climate change,² an aging population,³ public health crises,⁴ and disasters.⁵ Facing all of these challenges will require resilience, or “the ability to adapt and change, to reorganize, while coping with disturbance”.⁶ Resilient cities are also livable cities. Many of the factors that others have found improve liveability, such as human-oriented design, street activity, and social cohesion,⁷ are directly related to factors that we found promote resilience.

Much previous research on community resilience has focused on disasters⁸ and often in rural areas.⁹ While this has provided valuable insights, there is a need to explore urban settings and how communities develop resilience before disaster strikes. Community, household and individual resilience are interconnected.¹⁰ Community resilience has been defined as grounded in social interactions and community networks¹¹ and also based on individual well-being.¹² The literature on community resilience had tended to overlook the importance of place. While some researchers have noted the value of people-place connections,¹³ the research on community networks has placed little emphasis on the role of the planning and design of the built environment.

While under-emphasised in literature on resilience, the built environment is well established as an essential element for livable cities. All aspects of a city’s built environment can improve or worsen its liveability, including individual dwellings, streets, lighting, parks, signage, and all manner of public buildings.¹⁴ In order for cities to be livable, they must also have the infrastructure in place to connect all of these elements within a reasonable and safely walkable route.¹⁵

This paper will explore the interaction between community and the built environment and how that interaction can promote resilient communities. To do this we needed to understand more about these interactions, so we conducted a study with almshouses. Almshouses are: “...a unit of residential accommodation (usually a house or flat) which belongs to a charity, is provided exclusively to meet the charity’s purposes (for example, the relief of financial need or infirmity) and is occupied or is available for occupation under a licence by a qualified beneficiary”.¹⁶ The almshouse association is a charity that supports the over 1,500 almshouse charities in the U.K. The almshouse movement in England has a history of over a thousand years and new almshouses continue to be built today.¹⁷ Almshouse charities currently provide affordable homes for 33,000 people. While almshouses are not exclusively for older adults, many are reserved for people over a certain age (the specific age varies across sites but

participants in this research ranged in age from 59 to 97 years old at the time of participation) and all of the almshouse sites we worked with are communities for older adults. These almshouse communities can act as a microcosm of a city, the lessons from which can be applied more broadly to urban contexts.

METHODS

The study ran from January 2022 to July 2024 with the research question: What builds resilience in almshouse communities? Almshouse communities consist of past, current, and future residents, staff, trustees, governance, buildings, and grounds. Research was conducted at seven almshouse charities across England which acted as our project partners. The project was not an evaluation, but rather was looking for evidence of ‘what works’ for resilience. Contributors to the project included a full project team of seven people (four academic researchers, the Head of Research from one of the charities and a project liaison from two other key partner charities), a Residents Advisory Group (RAG) consisting of 11 almshouse residents from four of the partner charities plus one facilitator and one of the academic researchers from the core project team, and a Professionals Advisory Group for the project of 21 members with experts from housing, law, almshouses and equality, diversity and inclusion (EDI).

The primary research method used was semi-structured interviews with almshouse residents (n = 49), staff members (senior staff n = 16, operational staff n = 8) and charity trustees (n = 13). In addition to these interviews, the project conducted three focus groups with almshouse residents (n = 16); document analysis, including the charity websites, resident selection processes and annual reports; and site visits (n > 25) with ad hoc conversations written up as field notes, and photos taken of the site, facilities and relevant material such as notice boards. The study was approved by the university research ethics committee of the lead author. At each project partner site, residents were invited to participate in interviews through flyers on noticeboards, information about the project in email newsletters and, at the bigger sites, informational sessions to introduce the project. Staff were invited to participate in an interview through an email sent to all staff by the partner project liaison. Trustees were invited to an interview directly by email. Voluntary participation was emphasised in all recruitment. Abductive thematic analysis was undertaken on the data, resulting in thirty themes.

FINDINGS

The thirty themes were organized into four overarching factors contributing to resilience: valuing and supporting people, developing and strengthening community, enhancing the built environment, and focusing on the future. This paper is primarily concerned with two of these categories: enhancing the built environment, which includes design, maintenance, and continuing development, and valuing and supporting people which includes individuals’ psychological resources, diversity, and developing community ties and people-place connections. From the analysis, it was clear that there were multiple and strong interactions between themes. This paper will highlight three factors for resilience that demonstrate the intersection between community and the built environment: shared space, gardens, and transport.

Shared Space

Communal spaces varied across sites. Some didn’t have any, consisting only of self-contained homes. In those cases, communal spaces were missed, with one resident remarking:

“... what a place like this could do with is ... a little club area or something where people could go, even if you only put music on ... that’s the sort of thing that we could do with ...” (Resident 35).

Those almshouses that do have shared spaces range from a single small lounge to a series of common areas with different amenities and uses. These spaces allow for residents to maintain their independence while also providing opportunities for activity and connection, as one resident explained:

“You live your life. But you’ve also got that communal area. And you can do things. You haven’t got to be stuck.” (Resident 45)

A common type of shared space in the almshouses we visited is a lounge: a room with some chairs and tables, perhaps a TV and other activities like a shared stash of books and boardgames. These spaces allow for ad hoc, informal interaction to take place, as one resident described:

“I can take a walk down to the lounge, see who’s there, have a cup of tea” (Resident 11).

These spaces are also well suited for scheduled events and programming.

Shared spaces include not just dedicated rooms but also internal and external circulation areas, like hallways and paths. These areas allow for incidental interactions to take place, promoting connection among the community. As one resident highlighted: “You meet people in the hallway. I mean, it’s like, you know, you’re not alone” (Resident 25). These circulation areas represent the intersection between the private home and the public realm. Even without direct interaction, the visual connectedness of having a view out across shared areas provides a sense of integration with the community.

In whatever form they take, the provision of shared space is valued by residents and organizations. It is both an asset to the building and the community as well as a future opportunity for community building programming and connection. It is through the opportunities for formal and informal connection that shared space plays a critical role in developing relationships and networks in the community which lead to greater resilience.

Gardens

Communal gardens play an important role in the wellbeing of residents. In addition to being a shared space as discussed above, they provide a connection to nature and opportunities for exercise and engagement in hobbies. Gardening is a social pastime for many people, connecting residents to their community. Communal gardens specifically allow for that social element in addition to allowing residents to garden without the cost and time requirement of having to maintain a garden by themselves. One resident directly linked gardening to living an active lifestyle:

“... we buy plants and we put them in, and we go out there ... and we sit, there are chairs, and we talk, get a bit of sun. So yes, yes, we have got an active life” (Resident 49)

Gardening also allows for flexibility of management, encouraging those residents that enjoy gardening to take on the maintenance while allowing all residents to enjoy the garden.

Many almshouses are built in a horseshoe shape around a courtyard. This provides all the homes with a view of the garden and creates a sense of enclosure. Even residents who are not able to get out in the garden can enjoy the sights, sounds, and smells of nature from their windows. Even small gardens or individual planters can serve this purpose, with the added benefit of allowing people to personalize their space. Gardens play a key role in connecting people to each other, connecting people to nature, and connecting people to place. They are highly valued by residents and passersby. Through their role in improving well-being, as well as enabling social connection, gardens are valuable elements of resilience.

Transport

Connection to a place was something that many residents highlighted as a key factor in where they live. Many residents had a strong connection to the local community prior to moving into their home with the almshouse charity. Several factors allow for a continued connection to a local community, including prior familiarity with the area such as from growing up there, having loved ones who live nearby, local amenities like restaurants and places of worship, as well as proximity to activities like sports teams and dance classes. As most residents in the urban almshouse sites, we visited do not own a car,¹⁸ the key to accessing all these things that connect a resident to their local community is public transportation.

Having reliable bus, metro, and rail services are essential for this population. These modes of transportation also need to be accessible to people with a range of mobility and other needs. Walkability/rollability is also an important factor that can connect people to or disconnect people from their broader local community. This connection is not a static factor but one that changes for better or for worse over time, thus changing an individual's connection to their community. Bus routes can close down, new train stations can open, etc. Feeling connected to a broader community requires access to that community, making transportation and walkability/rollability essential to a connected and resilient community.

DISCUSSION

We found that the built environment resilience and social/community resilience were very closely linked. These findings demonstrate how good design provides the space for community to develop and thrive and how strong community protects assets. With a resilient built environment and resilient community, residents' individual resilience is improved. Almshouse communities can be considered as a microcosm of cities, in their development over time of both built estate and human community within a specific geographic location. What makes almshouses resilient can in turn teach us what makes larger communities resilient. A key to what makes almshouse communities resilient is the interaction between community and the built environment. Shared spaces make cities more resilient as they foster community connections and provide hubs for offering and accessing support. Gardens serve a similar purpose in addition to promoting biodiversity and connection to nature. Transport links all of these things ensuring everyone has access to the amenities that encourage community resilience.

Buildings that Promote Community

Whether building new buildings or adapting existing ones, considering the flow of people is crucial to promoting community building. Where possible, considering the location of the housing can go a long way to promote community integration. Places that are close to essentials such as doctors' offices, banks, and grocery stores as well as other amenities like restaurants, bars, recreation centres, and parks are highly preferable. Locations that are well connected via walkability/rollability and through accessible and reliable public transportation ensure access to these community assets and promote connection between different parts of the community. Within the housing itself, considering incidental meeting points in design, such as providing wide hallways and benches along garden paths, encourage conversation and connection among residents. Large and comfortable lounges that people want to spend time in are also highly valuable. These spaces should be versatile, allowing for ad hoc socialization as well as a diverse range of planned activities that can appeal to different residents. These events can include physical activities, meals, and game nights. These spaces promote community not just among residents but with the wider community as well. Permeable spaces can allow for non-residents to join in with activities and interact with residents to the benefit of both groups.

Green Cities are Resilient Cities

Similarly to the other communal spaces highlighted above, outdoor spaces allow for an even broader range of activities, including maintaining the space itself. They have the additional benefits to ecology; reducing the impact of heavy rainfall and heatwaves and providing opportunities for nature conservation and biodiversity. Gardens provide food and habitats for animals, insects, and pollinators. In that way gardens are beneficial not just for humans but for non-humans as well. The resilience to adverse weather events such as heatwaves and heavy rain that gardens provide is especially important in our ever-changing climate.

Buildings for Older People

The almshouse communities we focused on are specifically for older people, however the lessons of building for older communities are applicable more broadly. Observed considerations for older residents, particularly in new or adapted almshouses buildings, include ramps and elevators, sockets placed higher up on the wall, wider corridors and doorways to allow for mobility aids, mobility scooter charging stations, and hearing loops. All of these improve accessibility of indoor and outdoor shared spaces not just for older people but for disabled people of any age as well as for parents and children. Homes that are built for older people or are adaptable for the needs of older people ensure that people can stay in their homes as they age and/or as their access needs change. As well as making homes more livable, this allows the maintenance of social connections over time which contributes directly to community resilience. Age-friendly cities are resilient cities. The World Health Organization has identified housing, transportation, and outdoor spaces, buildings, social participation, and community support, all factors that we found promote resilient communities, as key elements of a city that allows people to age actively and with a high quality of life.²⁰

CONCLUSION

Our findings demonstrate that resilient cities will consider the built environment and the community and the reciprocal interactions between them. The built environment is critical for resilience, providing the essential amenities that individuals and communities need to thrive as well as the means of accessing those amenities. With these shared spaces including crucially green spaces, the built environment is essential for connecting people and creating resilient communities. Communities also play a key role in developing and maintaining the built environment. In this way communities and the built environment are strongly interconnected, and the reciprocal interdependence is essential for resilient cities. Building and adapting with strong communities in mind make cities livable and resilient in our ever-changing world.

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THE ROLE OF REAL ESTATE MARKET ON RESIDENTS' MENTAL HEALTH: A COMPARISON THROUGH 29 PROVINCES AND CITIES IN CHINA

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INTRODUCTION

The theoretical foundation of psychological well-being in urban design

The psychological impact of cities on people has been explored since the 1950s with Jane Jacob's book titled *The Death and Life of Great American Cities*¹ indicated the negative impact on mental health of modern urban planning on groups and individuals, and advocated for small, mixed-use communities.

The emergence of environmental psychology in the 1970s led to a search for interaction between humane and psychologically friendly urban environments design. With the subsequent introduction and popularization of 'sustainable development', urban planning has begun to incorporate elements of green space,² public transportation,³ and community building⁴ to improve the quality of life and psychological well-being of residents. Kaplan's Restorative Theory,⁵ proposed by Rachel Kaplan and Stephen Kaplan in 1989, posits that natural environments have a positive impact on restoring and replenishing mental fatigue. It suggests that elements of the natural environment such as trees, bodies of water, and expansive vistas capture attention, reduce stress and fatigue, and promote emotional and cognitive restoration after prolonged periods of focus or cognitive tasks. In addition, Ulrich's Stress Recovery Theory⁶ suggests that natural environments can even help individuals alleviate stress and restore mental and physical well-being. In addition to these two typical theories, Ecological Psychology, Psychogeography and Cognitive Cities interpreted the relationship between human and urban environment in different perspectives. More and more cities are practicing this by identifying citizens' inner psychological cognition and emotion more accurately through smart city technologies like Human Ecosystem Model⁷ to build friendly community environments, provide comprehensive mental health services, and enhance the accessibility and comfort of public spaces.

Why developing psychological - friendly cities is crucial to the society nowadays?

Psychologically friendly cities have been developed for decades and have become an inevitable trend in today's society. According to the data from WHO,⁸ globally, 1 in 8 people experience a mental health condition, with depression and anxiety among the most common. And In 2019, 970 million people globally were living with a mental disorder, with anxiety and depression the most common. What's more, people with severe mental health conditions die 10 to 20 years earlier than the general population. The Mental Health Action Plan⁹ 2013-2020 published by WHO proposes a series of strategies and

actions to improve urban environments to promote mental health, including improving the comfort and safety of urban living environments, and reducing stress and anxiety in urban life.

A literature review of of Economic Factors on the Mental Health of the Population Taking House Prices as an Example

The city's employment rate, housing prices, prices, public services, and welfare can fluctuate the mental health of its residents. Among those factors, house price is the dominant one. Kadir Atalay, Rebecca Edwards, and Betty Y.J. Liu conducted research in 2017, examining the impact of house price fluctuations on health.¹⁰ Utilizing data from the Household Income and Labour Dynamics in Australia Survey, with a sample of approximately 19,000 individuals, the study found that increases in local house prices positively affected the physical health of outright owners but negatively impacted the physical and mental health of renters.

Another study proposed by Jaewoong Won and Jae-Su Lee in 2020 emphasizes the importance of inclusive policy strategies to improve the environmental quality of public rental housing.¹¹ It highlights that residential environments significantly affect the social capital and health of residents. The study found that better-perceived residential environments for daily needs, such as utilities, equipment, safety, and accessibility to public transit and groceries, significantly benefit social capital or health. The study calls for more attention towards improving the environmental quality of public rental housing to better support residents' social capital and health.

Moreover, Songman Kang, Hyelim Son, and B.K. Song, investigates the impact of local housing price inequality on mental health in South Korea.¹² Utilizing comprehensive data, including all housing transactions in South Korea and individual-level medical records, the research uncovers a significant relationship between increasing local housing price inequality and the likelihood of individuals seeking medical attention for mental health conditions. Subgroup analysis reveals this effect varies noticeably by gender, age, and income levels, indicating a heterogeneous impact. Furthermore, housing price inequality also influences health-related behaviors, suggesting broader long-term health consequences of economic inequality. This study enriches the understanding of how economic factors like housing price inequality can have substantial and nuanced effects on mental health and social well-being.

METHODS

Quantifying Psychoemotional Values And Counting Resources Of Mental Health Institutions

We counted all mental health institutions in 29 provinces (autonomous regions and municipalities directly under the central government) in China in 2023, i.e., medical and health institutions providing diagnosis and treatment of mental disorders, psychotherapy, or psychiatric rehabilitation services approved and registered by the health administrative departments. The scope of the statistics is psychiatric hospitals (including Chinese medicine-type psychiatric hospitals); general hospitals (including Chinese medicine-type general hospitals and other non-psychiatric specialty hospitals); rehabilitation hospitals (including nursing homes, welfare homes, etc.); primary healthcare institutions; psychiatric outpatient clinics, and comprehensive outpatient clinics.

Collection of data on real estate development in the provinces

We have collected data the extent of real estate development in 29 provinces in China in 2023, Data related to real estate development include the average unit price, average total price, average household size, total number of listings, total square footage of listings, and the total market value of the real estate

market in the province. Statistics are based on listings listed for sale in the market in each province in 2023. The data was obtained from the National House Price Quotes website.

Developing the Correlation Model

We Construct multiple linear regression (MLR) model. The statistical correlation analysis starts from a classic multiple linear regression analysis:

$$\text{Psychoemotional Value} = \alpha_1 \text{Var}1 + \alpha_2 \text{Var}2 + \dots + \alpha_n \text{Var}n + \gamma + \varepsilon$$

Where Psychoemotional Value is the median psychoemotional values by province. The model includes the average unit price, average total price, average household size, total number of listings, total square footage of listings, and the total market value of the real estate market in the province metrics as the predictor variables. $\alpha_1, \dots, \alpha_n$ are the coefficient estimates of the metrics $\text{Var}1, \dots, \text{Var}n$ at the aggregation point i ,

γ is the model intercept, and ε is the residual.

As the basis of any further correlation analysis, MLR model was firstly constructed based on the variable subset we calculated and collected. There will be still dozens of candidate variables were still involved as the potential predictors.

Then the subset of predictor variables was further refined by adopting the following rules: Only variables with a p-value < 0.001 and VIF < 3 in the MLR model will be included.

RESULTS

Statistical report

As described in Figure 1 below, we have collected data on house prices and the extent of real estate development in 29 provinces in China in 2023, as well as data on psychoemotional value and mental health resources in each province. The psychoemotional value is measured based on the ability to control and regulate emotions, which means the more stable the mental state and the more capable of controlling emotions, the lower the number is. The psychoemotional value is divided into six grades of 1.025, 1.475, 1.925, 2.375, 2.825, and 3.275 by taking the median value of each province. House prices in each province generally decrease gradually from the coast to the interior, and the total number of units varies according to the size and development level of different cities. The psychosocial value is taken as the median value of each province, and the psychosocial value of the southeastern provinces of China is generally lower than that of the northwestern provinces. From the data descriptive statistics, the overall average of the average house price per unit in each province is 16,597 (yuan/square meter), with a standard deviation of 15,786 (yuan/square meter); the overall average of the average total price per unit in each province is 174 (millions of yuan), with a standard deviation of 154 (millions of yuan); the average household size average is 106 (m²) with a standard deviation of 9.4 (m²); the total number of sets The average value is 191,789 with a standard deviation of 170,643; the average value of the total area is 203,56510 (m²) with a standard deviation of 1,877,1018 (m²); and the average value of the total market value is 40,473,928 (million dollars). For psychological data, the median psychological mood value was 2.11 with a standard deviation of 0.653; the number of mental health facilities in each province was 191.48 with a standard deviation of 113.14; and the mean number of psychiatric beds was 16,645 (units) with a standard deviation of 11,406.54.

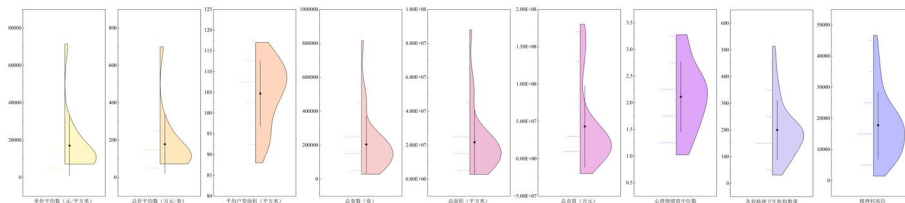


Figure 1. (From left to right) Distribution of data on average unit price, average total price, average household size, total number of units, total square footage, total market value median psychological mood, number of mental health facilities, and number of psychiatric beds by province.

Correlation Analysis

For the above data, we first did a correlation analysis. As shown in Figure 2 below, for the median psychoemotional value, we find that it has a significant negative correlation ($p < 0.05$) with the total number of units in each province, i.e., the more units there are, the lower the psychoemotional value, and the better the mental state. For the number of mental health facilities in each province, it was found to have a highly significant positive correlation ($p < 0.01$) with the total number of units, total area, and total market value, i.e., the higher the total number of units, the higher the total area, and the higher the total market value, the higher the number of mental health facilities will be. Similarly, for psychiatric beds, there is a highly significant positive correlation ($p < 0.01$) with total number of units and total area.

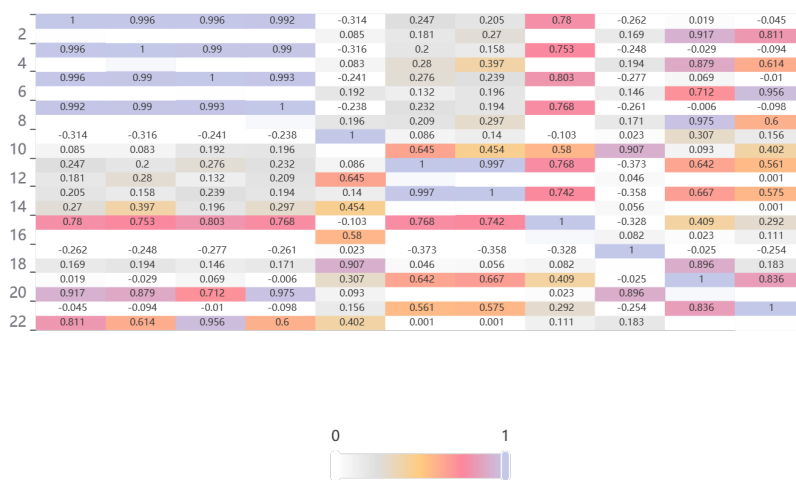


Figure 2. Correlation analysis of psychological data and real estate data.

Multiple linear Regression

Psychoemotional Value

For the psychological mood value and the data of housing market, we conducted the linear regression. We constructed the equation where the dependent variable is the psychological sentiment value, which is the y-axis. The rest of the real estate related data such as average unit price, average total price total number of units, total area and total market value are used as independent variables and are the x-axis. The R square of the fourth model of the second regression was 0.429 and the adjusted R-square was 0.305, so we can believe the accuracy of the results of the model. It shows that each province's psychoemotional value has a positive correlation with the average of the province's house price per unit,

and the total area. Which means the higher the unit price is and the bigger the total area is, the less stable and healthy the residents of that province will be. However, it has a negative effect with the average of the total price, and the total number of units. Which means the higher the total price is and the more units, the better emotion mode the citizens will be. In which the total number of units becomes the dominant factor as it demonstrates the maximum absolute value.

Health Facilities

We also ran linear regressions for the number of health facilities in each province and for real estate in each province, and we found that in the fifth model of the first regression, the adjusted R-square was 0.673, so we chose this model to analyze, and there are four factors associated with the number of mental health institutions in each province, in which the total price average and total area have a positive effect which means higher total price and more total area are associated with more health institutions. In contrast, the total number of units has a negative effect.

DISCUSSION

Compare with previous studies

Correlation analyses and multiple linear regression analyses jointly show that higher unit prices and total square footage were associated with less stable mental states, suggesting that housing affordability and density are key factors influencing resident well-being. In contrast, more housing units were associated with better emotional states, highlighting the benefits of affordable housing and diverse real estate supply. The findings are enlightened with other studies As Guoxu Wei and others concluded in *The Impact of House Price Growth on Mental Health: China* that one standard deviation increase in house price increase rate in the past three months is associated with a 0.443 standard deviation increase in people consulting with doctors about their mental disorders in the city, which revealed the potential negative consequences in people's mental health due to house price increase. Meanwhile, Masanori Kuroki also finds that unaffordable housing was associated with poor mental health among renters,¹³ which emphasizes the negative consequence on renters. All of the above findings from the literature are consistent with our findings from analyzing the data in this article, indicating that the conclusions of this article have some credibility.

Design Implication

These findings emphasize the importance of developing psychologically friendly urban environments. Policymakers should consider these insights to promote mental health through strategic urban planning that balances real estate development with the psychological needs of residents. Specifically, the following strategies and solutions should be emphasized:

First, increase the supply of affordable housing. The government should increase investment in affordable housing programs to ensure that low- and middle-income households have access to suitable living conditions. This will not only reduce economic pressure, but also improve the mental health of residents.

Second, optimize land use and planning. Create a more livable urban environment by rationally planning land use, reducing the development of high-density residential areas, and increasing green space and public space. A good living environment helps to reduce residents' psychological stress.

Third, strengthen mental health services. Increase mental health service facilities at the community level, such as psychological counseling centers and community health centers, to provide convenient mental health support. Ensure equitable distribution of mental health resources so that all residents can benefit.

Through the above strategies and measures, the psychological pressure caused by high housing prices can be effectively alleviated and the overall mental health of urban residents can be improved. Future urban development must prioritize affordable housing, equitable distribution of mental health resources, and community building initiatives to foster a healthier and more resilient urban population.

CONCLUSION

This study delves into the complex relationship between house prices and the mental health of urban residents. By analyzing data from 29 provinces in China, we observe that real estate market dynamics significantly affect residents' mental health.

The specific analysis shows that lower housing prices correlate with improved mental health outcomes, whereas a higher total number of housing units negatively affects these outcomes, necessitating more mental health institutions. These results emphasize the importance of developing psychologically friendly urban environments by creating a healthier real estate market in China.

This study deepens the understanding of the economic determinants of mental health and advocates for a holistic approach to urban planning that recognizes mental health as a core component of sustainable development.

However, there are some limitations to this article. We have not categorized the analysis for cities with different levels of development, while there is a very complex link between the level of urban development and house prices and the psychology of residents. Meanwhile, our study is limited to one year, which can be deepened in the future to analyze the relationship between the real estate market and the psychological state of the residents with a time span as the object of study.

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ARE THESE STREETS MADE FOR WALKING? HOW VISUAL AI CAN INFORM URBAN WALKABILITY FOR OLDER ADULTS

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INTRODUCTION

Research Statement: Urban Walking Matters!

With aging populations on the rise, the well-being of older adults has become a crucial consideration in urban design. Among the many interactions between older adults and their surroundings, pedestrian walking behavior is particularly important for their overall welfare.¹ For many, routine walking is not just a necessity but a vital part of their daily lives, offering both physical exercise and social interaction.² These regular walks significantly impact both the physical and mental health of older adults.

The spontaneity and quality of these walks are closely linked to the physical characteristics of the urban environment. Features like sidewalks, green spaces, signage, street lighting, accessible crosswalks, benches, and urban facades all influence the frequency, duration, and quality of walking experiences for older adults. Given the importance of these elements in shaping walking behavior, it is essential for urban designers and policymakers to thoroughly understand their impact and to explore strategies to improve the urban environment, promoting a healthier lifestyle for this demographic.

Literature Review: A Lack of Human Perspective in Walkability Studies

Considerable academic attention has been devoted to investigating the intricate relationship between the health status of older adults and their patterns of urban walking. Routine pedestrian activity has garnered recognition for its contributions to the physical and mental well-being of older individuals, primarily attributed to its accessibility and inherent opportunities for social engagement.³ This significance is particularly evident among older adults residing in urban neighborhoods, characterized by limited access to natural environments.⁴ The exploration of these associations between walking behavior and health outcomes in older adults has been conducted through both subjective and objective inquiries.⁵

While pedestrian behavior is shaped by the layout, scale, and spatial qualities of the built environment,⁶ assessing these complex relationships has been challenging due to difficulties in quantifying spatial features. Historically, research has focused on qualitative comparisons across neighborhood.⁷ However, recent advances have highlighted the need for quantitative assessments of the built environment and pedestrian behavior.⁸ Geographical Information Systems (GIS) and statistical techniques have been introduced to facilitate this, but they are limited by the constraints of GIS methodologies. Typically, GIS data comes from remote sensing or spatial boundary-based summaries, which adopt a top-down

planning perspective. Metrics often focus on large-scale aspects like transportation systems, land use, and population,⁹ oversimplifying the nuanced human experience of walking from a street-level perspective.

Therefore, there exists a compelling need for further investigations into the everyday elements that walkers, particularly the senior population, experience. It is imperative to establish a methodological framework that captures the nuanced connection of urban elements to pedestrian behavior, with due consideration to the human perspective.

Research Methodology: Visual AI on Walkers' Experience

In order to create a methodological framework to analyze the urban environment from a human perspective, this project utilizes machine learning methods to understand and quantify various urban elements based on street-view images. Visual AI methods like Object Detection and Image Segmentation are able to calculate the percentage of each urban element (Tree, Sidewalk, etc.)¹⁰ in one street-view image. Considering the abundant coverage of the Google Street View Image Dataset, this methodology would be able to well understand and summarize the quantitative details of the built environment. Because of the small scale of one unit sample data (one image), the quantification process is rooted in ground-truth summarization instead of over simplification and abstraction.

Instead of commonly used simulative methods such as surveys based on participants' subjectivity, this project uses ground truth data of people's travel behaviors to calculate walkability. The dataset used is the Hong Kong Travel Characteristics Survey (TSC) Data.¹¹ This government-led survey dataset includes detailed mobility and transportation information of more than 100,000 residents in Hong Kong. It documents all the trips each individual takes within a 24-hour time period, with emphasis on the details of those walk-only trips. From combining the demographic information and behavior data of these trips, a probability for older adults' choice to walk is calculated to represent the willingness of walking as the index for walkability. The scale and level of detail of this survey dataset provides a more accurate and compelling reflection of walkability for older adults.

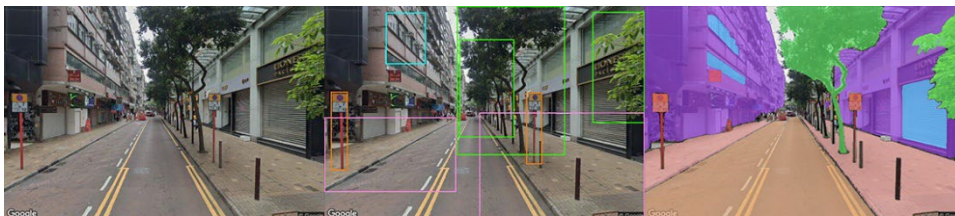


Figure 1. Visual AI Methodology: Street View Image – Object Detection – Image Segmentation.

HOW LIKELY ARE OLDER ADULTS TO TAKE A WALK?

Hong Kong Travel Characteristics Survey

The Hong Kong Transport Department regularly conducts the Travel Characteristics Survey (TCS) approximately every decade.¹² The TCS serves as a vital tool for gathering current data on residents' travel behaviors, contributing valuable insights to transportation planning and policy formulation. This project uses the 2011 TCS dataset as the primary source for older adult's walking behaviors. The use of this dataset in this project was authorized by the Hong Kong Transportation Department.

The 2011 TCS comprises three key sections, including the Household Interview Survey, which is the focal point of this research. With a sample size of more than 100,000 residents, this survey involves detailed questions about transportation trip information within the past 24 hours, including start/end

point, transportation means, transportation time, and travel purpose. This dataset offers comprehensive information on Hong Kong residents' mobility details.

Choice of Walking: The Measurement of Walkability

The TSC dataset offers a variety of travel information, providing different measures to evaluate walkability. Walking behaviors are assessed through factors like duration, location, and choice. Given this project's focus on the health benefits of regular walks among older adults, the analysis uses the choice of walking as the primary transport mode to gauge neighborhood walkability.

Key metrics from the TSC dataset used to quantify walkability include Age, Address, Trip Origin, Trip Destination, Modes of Transport, and Trip Purpose. By analyzing these data points and considering the voluntary nature of these trips, the research calculates the proportion of older adults choosing walking as their mode of transportation within a neighborhood, thus representing the area's walkability relative to other transport options.

Walkable Neighborhoods: Older Adults Walkability Analysis Result

The study focuses on Kowloon, Hong Kong, a district blending residential, commercial, and cultural spaces, with a significant elderly population, making it ideal for analyzing their walking habits. The area's street network and mixed land use provide a rich context for understanding elderly walking patterns.

By combining the TCS dataset with Hong Kong's TPUSB (Tertiary Planning Units Street Blocks)¹³ geospatial information, walkability for older adults in Kowloon is assessed on a scale from 0 to 1, enabling detailed block-level mapping. Spatial analysis of the data reveals certain patterns in the walking choices of older adults. Notably, areas with deeper red shades, indicating a higher percentage of elderly walkers, are concentrated in smaller blocks in locations like Mong Kok, Sham Shui Po to the west, and Kau Pui Lung to the east. These areas, with a historical urban fabric, typically have blocks around 50 by 100 meters. A significant concentration of walkability is found along the east-west axis streets, forming a continuous zone along the 50-meter dimension of these blocks. Surprisingly, areas near major public parks such as Kowloon Tsai Park and Kowloon Park do not show increased walkability, highlighting other factors influencing the walking habits of older adults.

Comparatively, an analysis of alternative transportation mode choices reveals that darker blue regions, symbolizing a preference for other transportation methods, predominantly reside in the central and northern sections of Kowloon, where blocks are irregularly segmented by thoroughfares and highways.

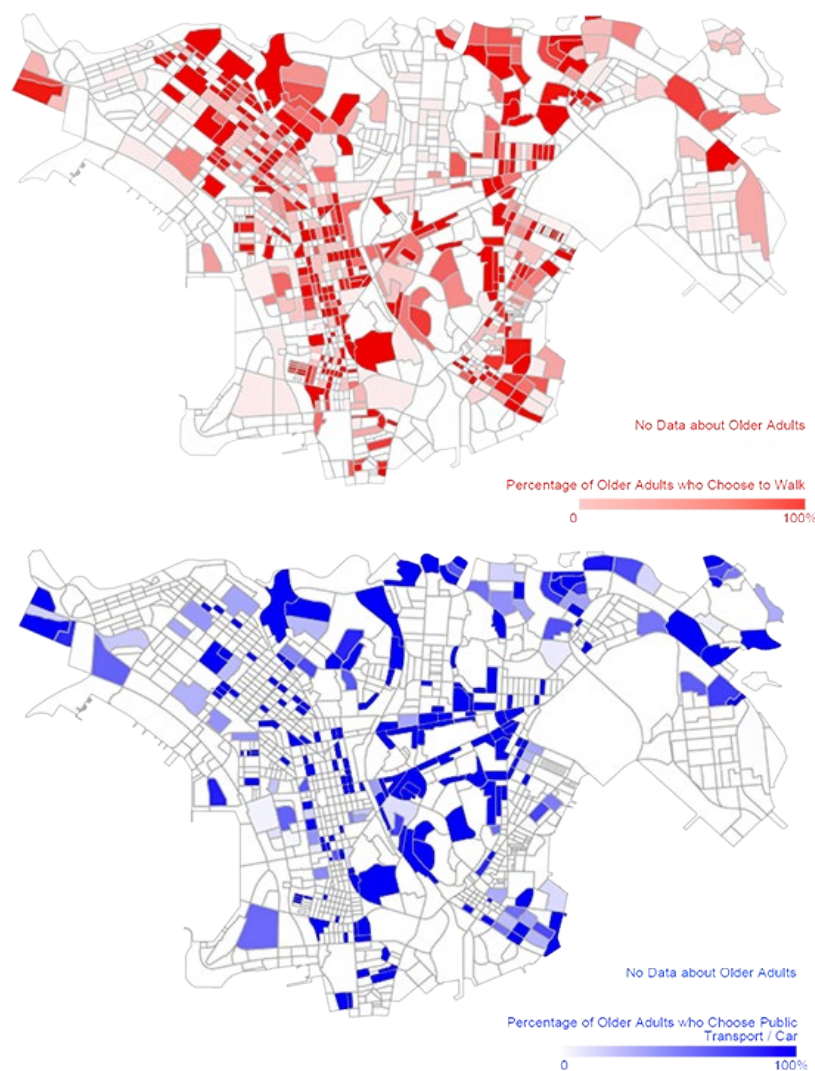


Figure 2. Mapping Result of Older Adults' Choice of Walking / Public Transport & Car.

HOW MANY URBAN ELEMENTS DO YOU SEE WHILE WALKING?

Google Street View Image Dataset

To accurately quantify the urban elements encountered during older adult walks, a comprehensive analysis of streetscape images is necessary. To this end, the project incorporates the Google Street View Image Dataset.¹⁴

This dataset offers a vast collection of street-level images from urban environments worldwide, accessible via the Google Maps API. These panoramic images provide the research with a detailed, quantitative understanding of the physical cityscape encountered during pedestrian walks, enabling an in-depth analysis of relevant urban features. The research collected a total of 32,512 images to examine the urban elements in Kowloon. Using a systematic approach, points were generated at 10-meter intervals along roads throughout Kowloon, with corresponding street view images acquired for each point. This method aims to offer a comprehensive and detailed depiction of the streetscapes in the Kowloon region.

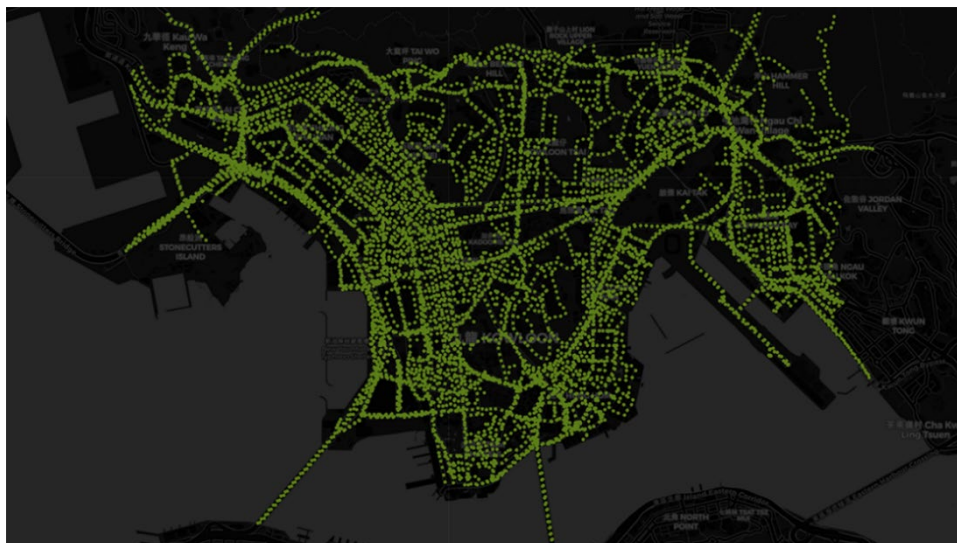


Figure 3. Data Points of Street View Images Retrieved in Kowloon Area.

How Much Do You See: Urban Element Quantification

The process of quantifying urban elements within this research project is fundamentally rooted in an image-based methodology. Employing advanced machine learning techniques, particularly object detection and image segmentation, the algorithm is adept at discerning specific objects within an image and precisely determining their spatial extent and location. This pixel-centric approach facilitates the extraction of object-specific pixel counts, enabling the calculation of an element's relative representation within the overall image.

The core machine learning models used in this project are Grounded DINO,¹⁵ which specializes in object detection and zero-shot recognition for labeling identified objects, and the Segment Anything Model (SAM),¹⁶ which focuses on segmenting diverse elements within images. By integrating Grounded DINO with SAM, the models work together to achieve precise instance segmentation and accurate object labeling. This combination creates a robust instance segmentation model tailored for the precise delineation and labeling of urban elements within images, enhancing the analysis and understanding of the urban landscape.

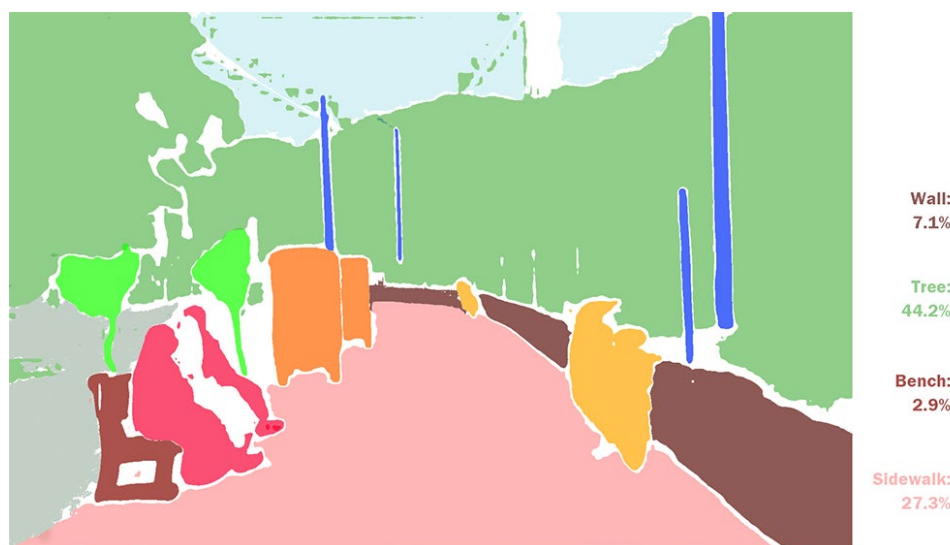


Figure 4. $Q(\text{Urban Element Quantity}) = PE (\text{Pixels of Urban Element}) / PI (\text{Pixels of Image})$

Urban Element Neighborhood: Urban Element Quantitative Analysis

To perform a correlation analysis, it was essential to align the geospatial base units of both walkability data and urban elements. Since walkability analysis uses the Hong Kong Administrative TPUSB code and Google Street View Images are based on latitude and longitude, a process was implemented to calculate the mean pixel percentage of each urban element within a TPUSB district as a quantitative metric. After these calculations, visualization maps were created to display the spatial variations of individual urban elements across Kowloon. This human-scale approach quantifies the variability of urban elements and complements the findings from Geographical Information System (GIS) analysis, providing an average representation of the visual experiences within each district.

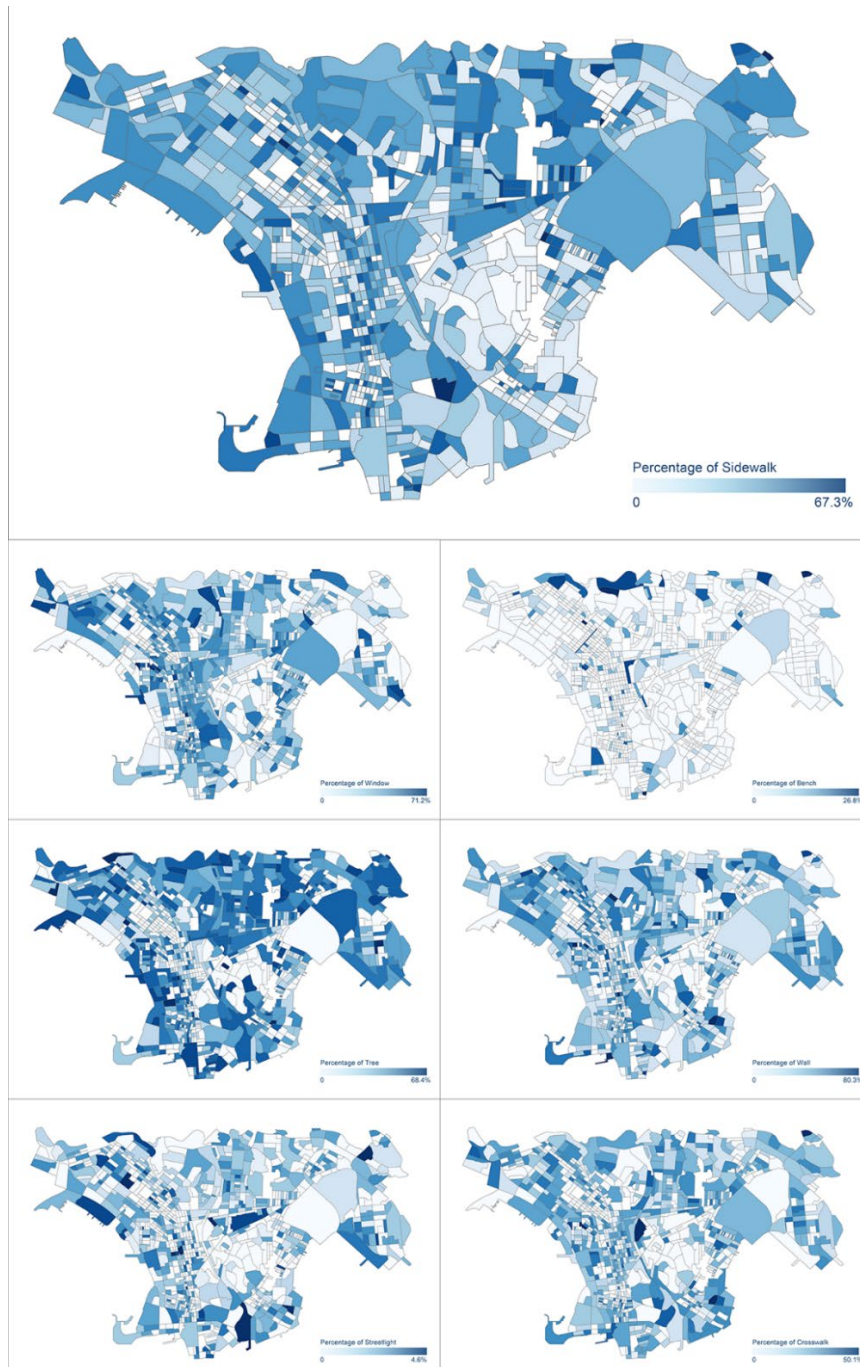


Figure 5. Spatial Mapping of Average Urban Element Pixels in Kowloon Area.

The conclusions from these maps reveal distinct spatial patterns in the distribution of urban elements, showing linear, center-focused, or scattered aggregation. These patterns will be thoroughly analyzed in the next chapter, particularly in relation to walkability data, to clarify how urban element distribution affects pedestrian accessibility.

HOW URBAN ELEMENTS AFFECT OLDER ADULTS' WALKABILITY

Spatial Overlay: How are urban elements affecting walkability

After quantitatively assessing walkability data and urban elements among older adults, it's essential to explore their spatial correlations. This requires using various methods, including 3D visualization, regression analysis, and Google Street View sampling, combining both quantitative and qualitative approaches to understand their interrelationships.

To analyze spatial correlations, this project uses visualization techniques to compare walkability with urban elements, identifying areas with strong positive correlations (e.g., high walkability-high urban element) or strong inverse correlations (e.g., low walkability-high urban element). Sampling Google Street View images from these areas allows for a qualitative examination of the urban environment, complementing the quantitative regression analysis. By learning from existing conditions, insights from these detailed observations contribute to refining design guidelines to improve walkability for older adults.

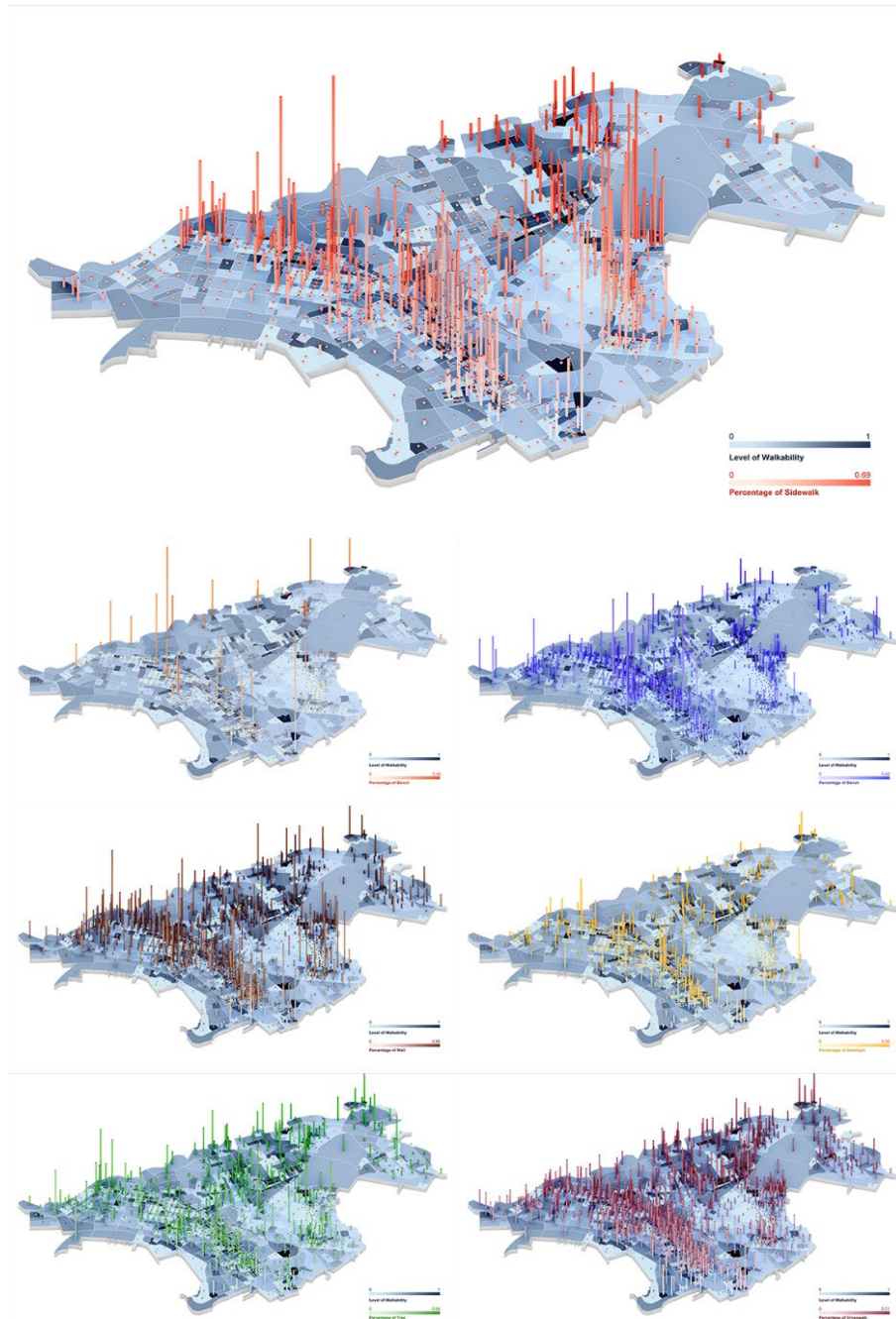


Figure 6. Juxtaposing the Quantitative Attributes between Walkability and Urban Elements.

Urban Elements and Their Interactions: Quantitative Correlation Analysis

This section applies statistical methods to analyze the correlation between quantified walkability data for older adults and urban elements. Due to the complexity of their relationships, various regression models are used to explore both individual and combined effects.

Initially, a single linear regression model is employed to assess the individual impact of various urban elements on older adults' walkability. This analysis addresses questions like “How much does one urban element affect walkability?” and “Is this influence positive or negative?”. The results show that elements like benches and trees have a stronger influence on walkability, but the coefficient of

determination (R-squared) values across all models are relatively low. This indicates that when considered in isolation, each urban element has a weak correlation with the walkability of older adults.

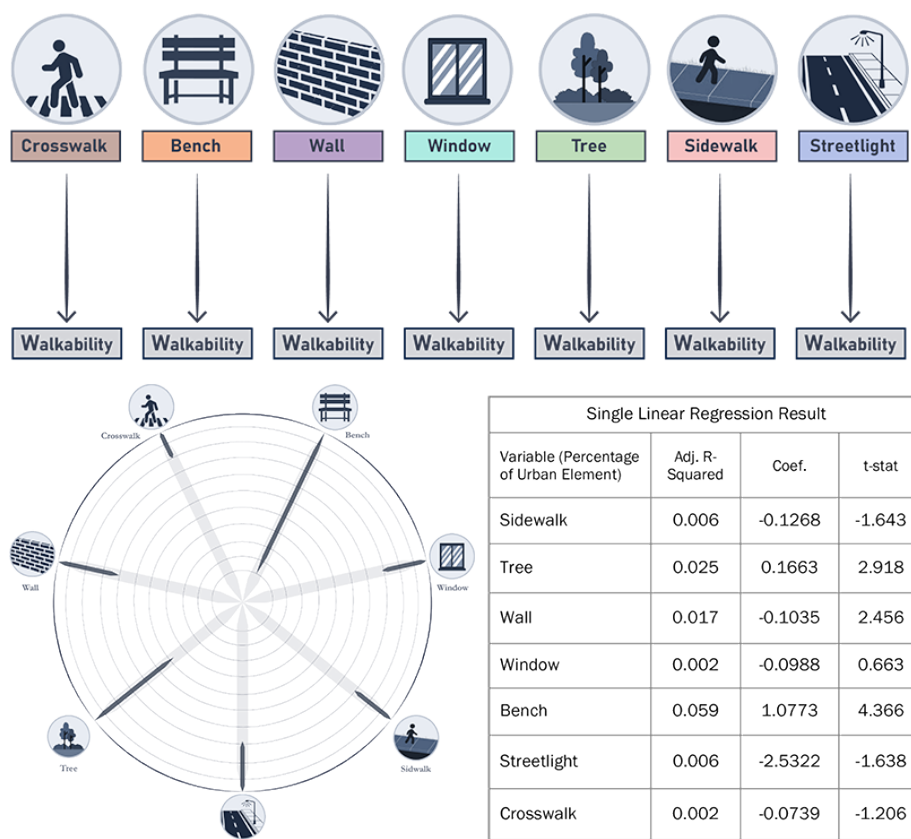


Figure 7. Single Linear Regression Result.

The decision to walk for older adults is complex, influenced by multiple factors at once. To explore these combined effects, a multiple linear regression model is used to assess how pairs of urban elements jointly impact walkability. This multivariate analysis examines whether these elements complement or counteract each other in improving pedestrian accessibility.

The R-squared in the multiple regression model generally increases compared to the singular model, indicating that paired urban elements better explain the variance in walkability among older adults. The analysis shows that certain pairs of elements, like benches and sidewalks, have a particularly strong combined influence, with areas featuring more of these elements displaying higher walkability. This model not only sheds light on how urban elements interact to enhance walkability but also provides valuable insights for qualitative analysis and urban design by identifying specific combinations that improve the pedestrian experience.

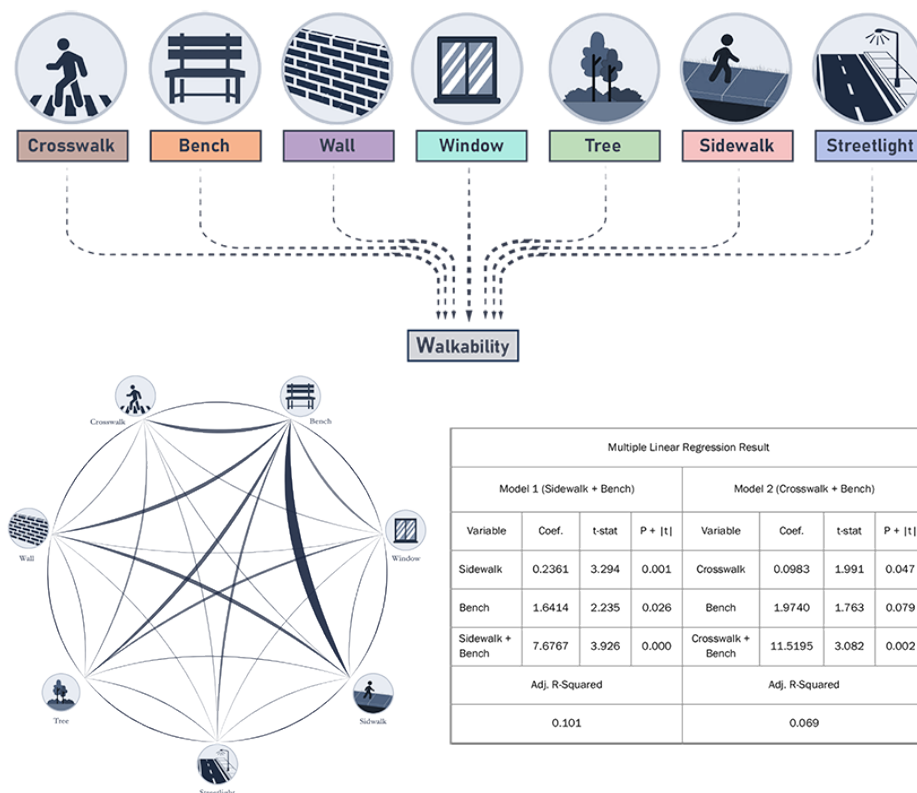


Figure 8. Multiple Linear Regression Result.

LESSONS FROM THE STREETS: A QUALITATIVE STUDY ON STREET VIEW IMAGES

From Data to Guidelines

The regression analysis statistically highlights the significant impact of various urban components on older adults' walkability, revealing which combinations of elements enhance walkability and how this varies across different areas. However, since the data is based on pixel values from images, reconnecting these findings to street view images can offer a deeper understanding of their real-world effects. By categorizing and abstracting these spatial compositions, design guidelines can be developed from the insights gained through these observations.

Walkability-Oriented Community Design Guidelines

Interval of Pedestrian Respite: Combining Street Furniture with Greenery and Open Space. Our research model shows when trees and benches increase altogether, an enhancement in walkability is achieved. This approach merges the functionality of street furniture with the tranquility of greenery and open spaces, resulting in a design guideline that reimagines urban environments.

A Connected Journey: Utilizing Urban Connections to Reach Inviting Space. 'A Connected Journey' addresses the notion that the quality of urban walk is elevated when people can traverse the cityscape with ease and comfort. By seamlessly linking stayable spaces, created through the strategic placement of benches and presence of trees, with a network of crosswalks and guided by the guidance and illumination of streetlights, older adults can develop a daily walk routine more easily.

A Conversational Routine: Promoting a Sense of Familiarity and Social Interactions During Walks. 'A Conversational Routine' is dedicated to redefining From examining details that enhance walkability in the street view images, we draw 4 main design guidelines for designers to build a more friendly community for older adults.

the daily act of walking, turning it into a social and community-building experience that is particularly beneficial for older adults. By designing facades openings and introducing stayable benches, we aim to create environments where every stroll becomes an opportunity for social interactions and enhancing mental well-being.

Facade Intimacy: Craft Street Dimensions to Create Intimacy between Pedestrian and Urban Façade. 'Facade Intimacy' is dedicated to shaping urban streets as spaces that evoke a sense of intimacy and connection between pedestrians and the surrounding built environment. By crafting the dimensions of streets, implementing strategic height-width ratios, increasing facade window openings, and incorporating urban furniture, we aim to curate an urban landscape that engages and resonates with the people walking its paths.

NOTES

- ¹ Yung Liao et al., "Walk Score® and Its Associations with Older Adults' Health Behaviors and Outcomes," *International Journal of Environmental Research and Public Health* 16, no. 4 (2019): 622.
- ² Conor Cunningham and Roger O'Sullivan, "Healthcare Professionals' Application and Integration of Physical Activity in Routine Practice with Older Adults: A Qualitative Study," *International Journal of Environmental Research and Public Health* 18, no. 21 (2021): 11222, <https://doi.org/10.3390/ijerph182111222>.
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- ⁴ Chris Neale, Jeffrey Hoffman, Daniel Jefferson, Jennifer Gohlke, Mehdi Boukhechba, Andrew Mondschein, Shaowen Wang, and Jenny Roe, "The Impact of Urban Walking on Psychophysiological Wellbeing," *Cities & Health* 6, no. 6 (2022): 1053–66.
- ⁵ Ji Hei Lee and Teck Hong Tan, "Neighborhood Walkability or Third Places? Determinants of Social Support and Loneliness Among Older Adults," *Journal of Planning Education and Research* 43, no. 2 (2023): 240–53, <https://doi.org/10.1177/0739456X19870295>.
- ⁶ Damian Poklewski-Koziel, Karolina Dudzic-Gyurkovich, and Carlos Marmolejo Duarte, "Investigating Urban Form, and Walkability Measures in the New Developments. The Case Study of Garnizon in Gdansk," *Land Use Policy* 125 (2023): 106471.
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- ⁸ Rachael L. Weiss, Juliana A. Maantay, and Marianne Fahs, "Promoting Active Urban Aging: A Measurement Approach to Neighborhood Walkability for Older Adults," *Cities and the Environment* 3, no. 1 (2010): 1–17.
- ⁹ Gavin R. McCormack, "Neighbourhood Built Environment Characteristics Associated with Different Types of Physical Activity in Canadian Adults," *Health Promotion and Chronic Disease Prevention in Canada* 37, no. 6 (2017): 175–85.
- ¹⁰ Tingting Li et al., "Semantic Segmentation of Urban Street Scene Based on Convolutional Neural Network," *Journal of Physics. Conference Series* 1682, no. 1 (2020): 12077, <https://doi.org/10.1088/1742-6596/1682/1/012077>.
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- ¹² "Hong Kong Government News," Hong Kong Special Administrative Region Government, February 28, 2014, <https://www.info.gov.hk/gia/general/201402/28/P201402280457.htm>.
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- ¹⁴ Google Street View API, accessed September 10, 2023, <https://developers.google.com/maps/documentation/streetview>.
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NOVEL PREDICTIVE PLANNING METHODOLOGIES FOR PANDEMIC RESILIENT COMMUNITIES

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INTRODUCTION

The UK Covid-19 Inquiry was introduced “to examine the UK's response to and impact of the Covid-19 pandemic and learn lessons for the future” Baroness Hallett's summary¹ underlines the imperative for systemic reform in the UK's public health strategy, highlighting that the nation was “ill-prepared” and “lacked resilience” due to “outdated and untested strategies, labyrinthine systems, and pre-existing high levels of illness [...] Unfortunately, the expert evidence suggests that they will be called upon again. It is not a question of ‘if’ another pandemic will strike but ‘when’.” Recent news about the mpox emergency² confirms this assumption. The research objectives presented in this paper align with these findings and emphasize the need for proactive and preventative town planning strategies to support effective pandemic response and future resilience. This Postgraduate - Group Project Research, conducted at the University of Cambridge Institute for Sustainability Leadership (CISL) in the Interdisciplinary Design in the Built Environment programme, concludes that new tools and hybrid methodologies involving both medical and planning professionals offer a robust approach to the planning of pandemic-resilient communities, at the neighborhood scale in particular.

PANDEMICS: A BUILT ENVIRONMENT CONTEXT

Increasing urbanization

The urban population is expected to double by 2050, meaning the number of people living in cities will rise from fifty percent today, to nearly sixty six percent of the global population.³ Growth leads to increased density making urban environments more susceptible to health disasters like the Covid-19 pandemic.⁴ This vulnerability is explored in academic literature which makes the correlation between changing climate, globalization, urban design, and virus spread,⁵ (Figure 1). And yet, post-Covid, most cities have returned to a ‘new normal’ that is remarkably similar to life before the pandemic, despite the disastrous economic and societal impacts of the containment and mitigation strategies employed to control the disease while a vaccine was being developed⁶. This appears to be an opportunity missed for learning valuable lessons.

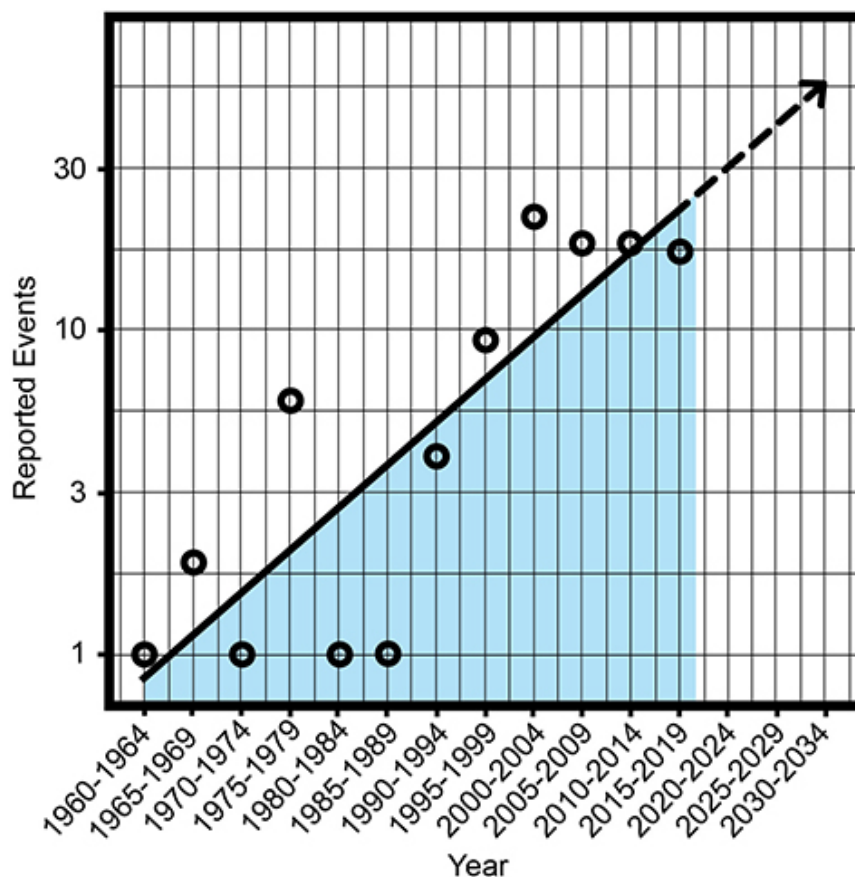


Figure 1. Increased frequency of epidemics from wildlife⁷

Motivation and background

There is a history of research into urban planning responses to health events, from segregation and sanitation policies in response to plague and cholera, to new fresh air supply and daylight penetration requirements to fight tuberculosis.⁸

- Casualties: Forty-one million people die per annum from noncommunicable diseases (NCD) – equivalent to seventy four percent of global deaths.⁹
- Non-Communicable Focus: NCD (cardiovascular, cancer, chronic respiratory diseases and diabetes), unlike Covid-19, is missing key issues related to infectious diseases in urban areas.¹⁰
- Pandemic Prevention: Academic discussions highlight two main strategies of containment (quarantine, lockdown) and mitigation (social distancing, masks, closures).

Post-Covid, research looking into preventative built environment adaptations ranges from revised ventilation strategies,¹¹ layout changes¹² and use of geospatial analysis to facilitate disease containment.¹³ However, little research is found at neighborhood or community scales, leaving a knowledge gap in these building blocks of urban environments. Given the significant built environment impact, it is reasonable to suggest that there should be established mechanisms for coordination and dialogue between designers and healthcare specialists, as is generally mandatory with structural, mechanical, and environmental professionals.

Historical context

Throughout history, control measures through urban design have included quarantines, sanitation policies, and land zoning laws. For instance, around 274 BCE, Plato advocated land zoning within cities.¹⁴ Significant urban reforms resulting from pandemics – e.g. Paris's Haussmann renovation and London's Thames embankment redevelopment (Figure 2) – arose from efforts to combat plagues and cholera, improving sanitation and urban living conditions.



Figure 2. Depictions, before (left) and after (right) redevelopment of London's Thames embankment to combat cholera and improve sanitation (public domain)

Subsequent pandemics, including the 1918-1920 'Spanish' influenza¹⁵ and tuberculosis¹⁶ led to changes in prioritizing natural light and ventilation, shaping building standards for enhancing well-being. Examples for interventions are exemplified by Alvar Alto's Finnish sanatorium which maximized daylight and air penetration to aid patient recuperation (Figure 3). Whilst all responses have improved the built environment to varying degrees, they have typically been reactive measures by nature.



Figure 3. Alto's Finnish sanatorium design principles; maximizing daylight, proximity to nature, and fresh air circulation¹⁷

Since the beginning of the 21st century, thirty-six geographically emerging diseases have been identified.¹⁸ This trend is exacerbated by increasing urban density and global travel. As represented in Figure 4, pandemics correlate to increasing urbanization of the global south.



- | | | |
|--|--|--|
| <p>Global: 2009 - Influenza A(H1N1)
 Global: 2019 - SARS-COV-2
 Global: 2022 - Mpox</p> <p>1: 2009 - Heartland virus
 1: 2011 - Influenza A(H3N2)v
 1: 2014 - Bourbon virus
 1: 2022 - Avian influenza A(H5N1)
 2: 2010 - Cholera (Haiti)
 3: 2013 - Chikungunya (Caribbean)
 4: 2020 - Oropouche virus
 5: 2003 - Chapare virus
 6: 2021 - Alto Paraguay virus
 7: 2015 - Zika virus
 7: 2014 - Chikungunya
 8: 2013 - Variegated Squirrel Bornavirus
 8: 2019 - West Nile virus
 9: 2019 - Tick-borne encephalitis
 9: 2022 - Avian Influenza A(H5N1)
 10: 2007 - Chikungunya
 11: 2016 - Crimean-Congo haemorrhagic fever</p> <p>■ Newly identified emerging infection
 ■ Disease identified in new area</p> | <p>11: 2022 - Avian influenza A(H5N1)
 12: 2009 - Lassa fever
 13: 2021 - Marburg virus
 14: 2014 - Ebola virus
 15: 2022 - Marburg virus
 16: 2011-2016 -Lassa fever
 17: 2022 - Dengue
 18: Human T-Lymphotropic virus (HTLV)3, HTLV4
 19: 2019 - Rift Valley fever
 20: 2018 - Guinea worm
 21: 2008 - Lujo virus
 22: 2009 - Bas-Congo virus
 23: 2013 - Sosuga
 24: 2020 - Chikungunya
 25: 2021 - Avian influenza A(H5N1)
 26: 2019 - Dengue
 27: 2012 - Middle East MESCOV
 28: 2017 - Lyme disease
 28: 2019 - Avian influenza A(H5N1)</p> | <p>29: 2011 - Plasmodium cynomolgi
 30: 2012 - Severe fever with thrombocytopenia syndrome
 31: Candida auris sp.nov.
 31: Yezo virus
 32: Severe fever with thrombocytopenia syndrome
 32: 2012 - Mojiang Paramyxovirus
 32: 2013 - Avian influenza A(H7N9)
 32: 2013 - Colpodella sp. Heilongjiang
 32: 2014 - Avian influenza A(H5N6)
 32: 2017 - Rat hepatitis E virus
 32: 2021 - Avian influenza A(H7N4)
 32: 2022 - Avian influenza A(H10N3)
 32: 2022 - Avian influenza A(H3N8)
 32: 2022 - Langya henipavirus
 33: 2020 - Guinea worm sp.nov
 34: 2021 - Avian influenza A(H5N6)
 35: 2020 - Severe fever with thrombocytopenia syndrome
 36: 2008 - Multi-drug resistant P. falciparum</p> |
|--|--|--|

Figure 4. Global distribution of 36 most recent epidemic infectious diseases¹⁸

Existing frameworks

The World Health Organization (WHO) and the UN Habitat's 2023 sourcebook¹⁹ both integrate health aspects into planning, focusing on disease prevention and health inequalities. However, a clear gap has been identified regarding communicable disease and the implementation of preventative, predictive methodologies. This research therefore analyzes shortcomings and proposes novel approaches. A range of urban design criteria need to be addressed (Figure 5), and strategic interventions considered for the neighborhood scale (Figure 6).

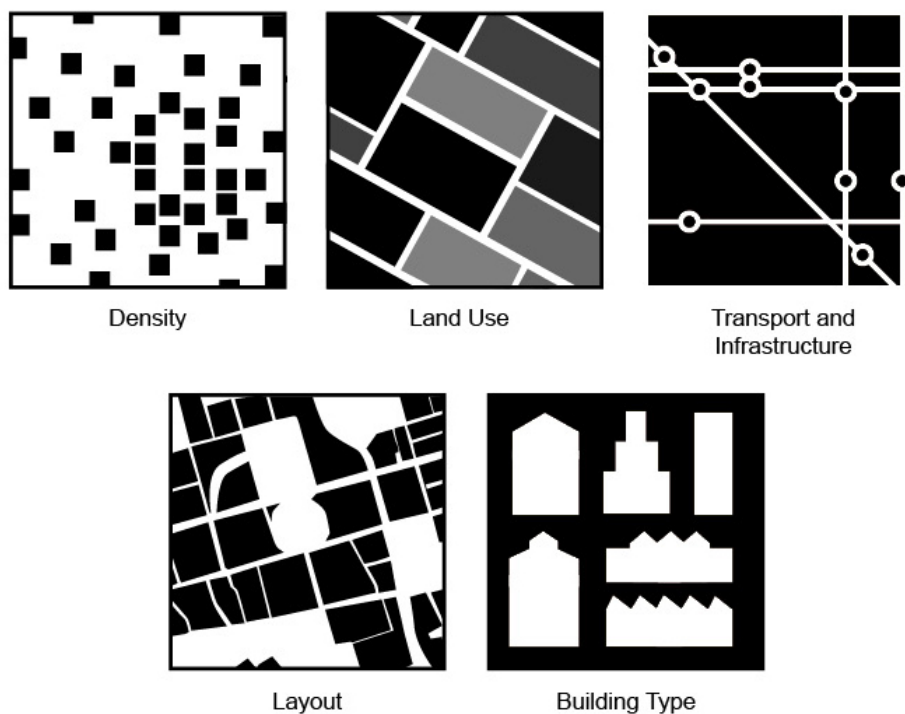


Figure 5. Five components of urban planning



Figure 6. Default approaches to pandemic control; containment (left) and mitigation (right)

RESEARCH METHODOLOGY

Literature review

The review demonstrates a lack of guidance on the health impacts of urban morphology at a district level. The neighborhood’s density, interconnectedness, layout, form, or size affect its resilience. Whilst literature covers urban planning and pandemic prevention, solutions only provide generic guidance such as 'de-densifying buildings'.

Overview of reviewed paper types

The review was classified by type, including academic and grey literature, supported by guidance from government and industry bodies (Table 1). A significant gap was found at the neighborhood scale, with very limited numbers of papers post-Covid.

Article Categorization	Qty
Academic	51
Governance / Industry Bodies	18
Grey Literature	12
Total	81

Table 1. Overview of literature sources by type

Gap analysis and resulting approach for data collection

A deductive research methodology used data to test the hypothesis that a) current methodologies do not allow for built environment professionals to involve disciplines from other sectors, in planning, b) improved interdisciplinary working between healthcare and built environment professionals could lead to more effective preventative planning strategies, and c) the combination can improve resilience to future health and pandemic events. An online survey addressed the objectives cross-sectionally, and recipients were intended to be UK based.

Questions aimed to shed light on existing response mechanisms, identify ongoing research, understand whether interdisciplinary work was already happening, review potential mechanisms for improvement, and identify existing tools and initiatives upon which this work might build. The questionnaire included dichotomous, inventory and Likert scale questions to provide numeric data for statistical analysis. Open questions allowed for more nuanced answers. Recommendations, following peer review of the final draft, by the UK Office for National Statistics, were implemented. A purposive sampling approach targeted five specialist sectors:

1. Government policy and planning.
2. Academic and private sector research.
3. Governing and regulatory bodies.
4. Built environment (architects, urban planners, and specialist designers).
5. Healthcare.

Whilst it was important that data remained anonymized, identifying questions were asked at the outset, to establish sector expertise and seniority, and to enable cross-referencing in the analysis.

Survey Methodology

The proprietary survey-hosting web-app ‘Qualtrics’ was used to publish a web-link to a user-friendly, browser-based interface. The poll targeted one hundred respondents, expecting sixty to eighty completed surveys. Eighty-nine responses from all sectors were recorded over a three-week duration. Snowballing was used to increase total exposure.

Data cleansing

Surveys were excluded where:

- Not all compulsory questions were completed.
- Only the self-identification questions had been completed.

No exclusions for erroneous completion were required, and the final count for compliant surveys was seventy-five (Table 2).

Data inputs	Data
Survey open	3 weeks
Targeted responses	100
Received responses	89
Incomplete responses	14
Final dataset	75

Table 2. Summary of survey collection results

DATA ANALYSIS

Findings in the literature suggested that the views of individuals from the ‘built environment’ and ‘healthcare’ sectors would be most valuable, so a strong response in these areas enriches the results (Figure 7). To produce representative results, a diverse range of participants in terms of seniority was sought, and a fair distribution across different hierarchies of organizations was found (Table 3).

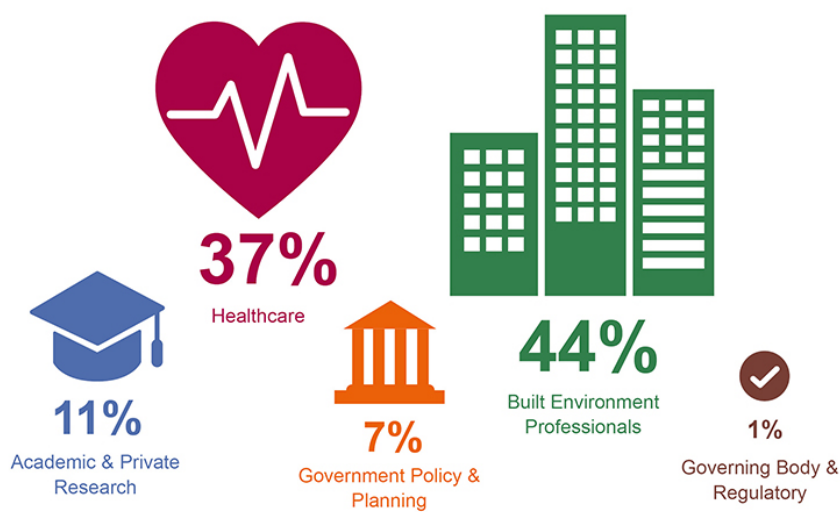


Figure 7. Summary of survey participants by sector

Seniority	Proportion
Senior manager / Director / Partner	31%
Department Head / Team Manager / Junior Partner	15%
Senior Team Member	29%
Team Member	25%

Table 3. Summary of survey participants by seniority

Responses related to the gap analysis

Qualtrics captured anonymized IP address data, which showed that of the seventy-five respondents, sixty-eight were UK-based. The geo-location data analysis demonstrated distribution across Great Britain and confirms that analytical outcomes are applicable UK-wide.

DISCUSSION

Observations regarding pandemic prevention strategies

The literature review concluded that it is desirable to a) act more proactively and predictively, and b) create preventative strategies for future events. The survey asked if it was believed that there has been an adequate response since the Covid-19 event, to learn, and plan for future events. Eighty-four percent said that there had not, and this ratio was steady across all sectors. This represents a desire to ‘get back to normal’ and focus on rebuilding the damage wrought by recent events, ignoring the opportunity to learn from the details. Of the eleven respondents who said that they did believe an adequate response was happening, the majority (seventy-two percent) said that this was happening at either national or regional level, and thirty-three percent believed it was not happening at neighborhood scale.

Relevance of interventions at the appropriate scale

When asked at which scale the health planning interventions might be most effective, approximately sixty percent recommended the National level. However, responses represent a notable dichotomy between healthcare and built environment professionals (Figure 8).

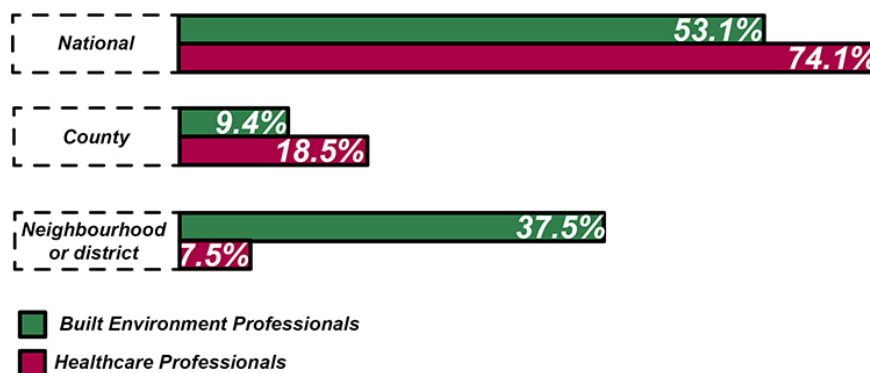


Figure 8. Split between BE and healthcare professionals in responses about scales

When questioned about which scales were being adequately managed, results clearly matched findings in the literature – that planning at neighborhood and district scale was being ignored (Table 4).

Scale	YES	NO
National level	<u>90.9%</u>	9.1%
Regional / City-wide level	<u>90.9%</u>	9.1%
Neighborhood or District level	18.2%	<u>81.8%</u>
At Building scale	45.5%	<u>54.5%</u>

Table 4. Scales at which the response was seen to be adequate

Use of Information Technology (IT) and Artificial Intelligence (AI)

Amongst health sector respondents, assumed to have limited experience with interventions in buildings and neighborhood design, over ninety percent said that high-level interventions (like policy changes and guidance literature) would be best. Results from the other sectors showed divergence, reinforcing the need for improved interdisciplinary working. Despite a tendency to act in line with the ‘top-down’ nature of healthcare service operation, interacting with built environment professionals could show the effectiveness of local interventions. Static offline calculators were strongly rejected while solutions with mapping and predictive capabilities were rated highly. It can’t be ruled out that this response was connected to a general trend towards technological solutions, but even taking this into account, there would appear to be a strong mandate for using it. Geo-spatial data maps and AI supported analytics are ideal for this type of predictive modelling and could powerfully synthesize data to mitigate risk factors.

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that novel interdisciplinary working methodologies can effectively improve the identified shortcomings:

- The industry needs a preventative planning framework that doesn’t currently exist.
- The application of such a framework might require the development of new sector expertise, or a dedicated new discipline of practice that bridges the established gaps.
- Such practitioners would need a new toolset that requires development.

The proposed new planning framework

The research finds that the development of a new framework could promote the sharing of knowledge between the stakeholders in the healthcare and built environment design sectors. This would provide valuable opportunities to build new relationships between the sectors, and to encourage multi-disciplinary working at greater frequency and better quality. However, the findings of the survey also suggest that a more systematic approach would be more likely to address the urgency that this field requires.

A multi-disciplinary approach

To apply science-based learning to the design of built environment assets, current exemplary frameworks for other applications in this field were studied. Programs exist where statistical modelling of outcomes is distilled into simplified checklists and presented as a ‘best practice’ standard. Examples include the ‘Secured by Design’ national building approval scheme and the range of overlays to the Royal Institute of British Architects’ (RIBA) ‘Plan of Works’.²⁰ These include voluntary, multi-disciplinary certification processes, where a set of interventions is measured against science-based standards. To promote higher levels of occupant’s health and well-being, design proposals can be assessed against such criteria. To be proactive, a design team could consult with a trained assessor, who would use a specially configured tool to rate a given set of proposed interventions. This would be analogous to having direct assistance from members of the healthcare profession and other interdisciplinary actors, in the creation of a newly reconfigured neighborhood masterplan.

A proposed new digital toolset

Both, literature review and survey results suggest that a) the most effective method for applying such a collection of complex and wide-ranging science-based targets, is where the learning is distilled into a standardized and scalable methodology or checklist process as noted above, and b) truly sustainable benefits of being able to apply such powerful data, collected from a variety of benchmarked systems,

and using interdisciplinary knowledge bases in ways not previously interconnected, are manifold. Accordingly, Figure 9 describes a proposed hierarchy of innovation pathways that could be employed in the creation and implementation of such a toolset.

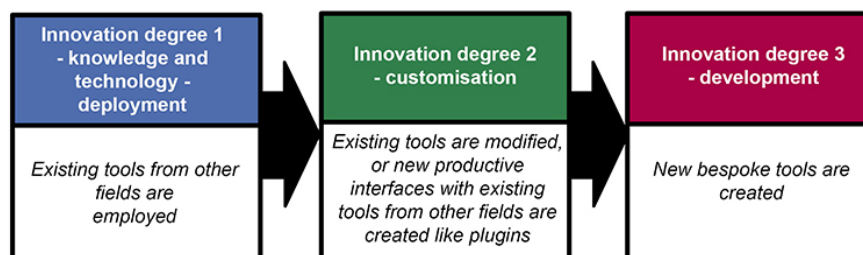


Figure 9. Proposed hierarchy of innovation pathways

A revised planning and enhanced healthcare approval framework

The survey confirmed the literature findings which identified that no ‘end to end’ framework exists that brings together interdisciplinary learning across several stakeholder sectors that would be useful to address – in planning, design and implementation – the risks associated with disease spread. As this intervention would clearly be best applied at an early design stage, a further recommendation of this study is that the proposed framework could be implemented as part of the RIBA ‘Plan of Works’ program in the UK as a necessary part of the design stage development of a neighborhood’s master plan (Figure 10). Topical amendments like Security and Inclusive Design Overlays already suggest such focused interventions to the baseline process.²¹

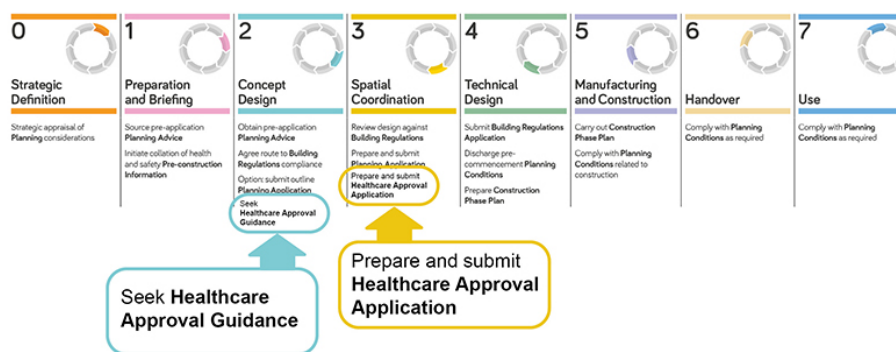


Figure 10. Proposed insertions into the RIBA Plan of Works process (after RIBA, 2020²²)

Audiences for the research findings

According to the identified groups, these recommendations are particularly relevant to:

- Policy makers in government.
- Policy developers at industry bodies (e.g. RIBA, RICS, NIHCE) looking at the creation of sustainability strategies and the promotion or design of new or updated engagement frameworks.
- Local authority planning departments involved in retrospective assessment of successful implementation against neighborhood master plans.
- Built environment practitioners engaged in the development of neighborhood master plans (as a sub-component of a wider urban network).

- Healthcare professionals involved in predictive pandemic prevention strategy creation.
- Procurement, finance and insurance entities.
- Data technologists involved in the use of spatial mapping tools which can use predictive data sets to model risk levels for a given set of design interventions.

Key development recommendations

The analysis concludes that the following key developments are required to meet the research objectives. The findings suggest that the return on investments in the proposed framework and tool developments would be extremely high. The analysis further supports the justification of funding being sought for a high-level, interdisciplinary consortium to be established to:

1. Gather evidence to define key risks.
2. Categorize criteria to be used in a framework.
3. Establish methodologies for multi-disciplinary knowledge sharing.
4. Build a risk modelling paradigm.
5. Develop a risk modelling tool.
6. Specify a new discipline profile, to apply methodologies in the design team.
7. Negotiate (with industry bodies and planning policy makers in government) the integration of new assessment processes with existing design-planning frameworks.
8. Measure impact in a set of planning specific KPIs.

As emphasized during the data analysis, items 1, 2 and 5 will require further research to ensure that these criteria are scientifically valid. History shows us that urban morphology can be positively influenced in response to disease events, but changes have always been reactive in nature. New technology paradigms, and the promotion of interdisciplinary working, offer the promise of a predictive and risk-based approach to urban reconfiguration. This can be exploited to reduce our vulnerability to disease events, which, in an increasingly interconnected world, will become more commonplace. These recommendations provide a pathway to creating high-tech, high-impact predictive tools embedded in a novel framework that promotes knowledge-sharing between the healthcare and built environment sectors.

LIMITATIONS AND FURTHER RESEARCH

Research limitations include:

- A larger pool may offer a greater depth for analysis.
- GDPR and resulting data processing limitations.

Future research proposals and recommended developments:

- A comprehensive risk assessment framework: to identify and compile potential risk criteria and mitigation strategies.
- New predicative planning tools: based on existing frameworks with interventions along existing pathways.
- Digital Technologies: to enable now risk modelling and AI supported assessment methods.
- Finance Modelling Approaches: for developments resulting in a positive return of investments into new tools.
- Sponsorship: of a high level, interdisciplinary expert consortium as required for project steering.
- Development of new project roles and hybridized professional profiles between urban planning, systems design and medical teams.

In the context of recent analysis and governmental reporting, the relevance of this research, and new approaches, is highlighted.

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SMART CITIES AND THE SILENT TOLL: MORAL INJURY IN THE DESIGN AND CONSTRUCTION

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INTRODUCTION

A raft of challenges faces the construction industry, at the forefront of underexplored area is moral injury. While accidents, fatalities, post traumatic disorder have significant literature in construction this study examines moral injury (MI), a profound psychological distress triggered by actions or decisions that fundamentally violate deeply held moral principles and ethical standards.¹ Preliminary survey findings indicate that 90% of professionals are unfamiliar with the term 'moral injury,' despite its association with significant risks, including long-term psychological distress, reduced organizational trust, and systemic workplace inefficiencies.² In the construction industry, which is characterized by high-risk environments, a staggering 90.8% fatality rate in specific incidents further underscores the urgent need to address moral injury.³

Thus, necessitating the research questions: to what extent do construction workers experience moral injury (MI) in the construction industry, and what is the prevalence and impact of this silent toll? To bridge this knowledge gap, the research employs a rigorous mixed-methods framework, incorporating action research inclination, qualitative data from personal experiences and quantitative data through the categorization and counting of themes.⁴ The study synthesizes theoretical perspectives from psychology, medicine, and military studies with empirical data from the construction sector. The analysis identifies both immediate and long-term repercussions of MI, including emotional distress and professional disenfranchisement.

Methodology and Data Analysis

The study, conducted under the leadership of an experienced Associate Professor and co-authored by experts with distinguished credentials, adopted a qualitative approach to investigate moral injury (MI) within organizational and industry contexts, emphasizing its social and cultural dimensions.⁵

Using an online methodology, 229 respondents, including 16 subject-matter experts, participated, representing a diverse industry cross-section as shown in Table 1.⁶ These "experts" comprised not only academically credentialed individuals but also non-academic professionals with over 20 years experience and demonstrated behavioral maturity in construction.⁷ Respondents completed online questionnaires addressing demographics, occupational status, self-assessed physical and mental health, and employment history. Trained assistants facilitated data collection to ensure accurate representation

of respondents' experiences with MI. Fifty questions targeted fifteen items (e.g., regret, violence, shame, guilt, fear, and alike) that measured three principal MI dimensions

Bias and Attrition

To mitigate common method bias (CMB) and attrition risks associated with repeated surveys targeting the same sample,⁸ three measures were implemented: (1) a shorter questionnaire (50 questions each a minute instead of the standard 149 questions short questionnaire) to reduce fatigue;⁹ (2) WhatsApp as a secondary data collection tool for clarifications and feedback, which has gained scholarly interest with 1.5 billion people for enabling nuanced qualitative data collection through voice and video calls, capturing facial expressions, tonal variations, and inflections; and (3) transparent administration of the survey process.¹⁰ Respondents expressed greater comfort discussing sensitive issues via WhatsApp compared to face-to-face interactions, aligning with previous research on online survey methodologies.¹¹ WhatsApp's affordability and accessibility further enhanced data quality and depth. Recurring themes, including guilt, betrayal, and ethical conflict, were visualized through a word cloud as illustrated in Figure 2a and aligned with findings from earlier studies.¹² Additionally, professional memberships online register, such as affiliation with the Nigeria Institute of Architects (NIA), enabled geographical and professional diversity for analysis.

Expert Sub-Group Validation

To ensure methodological robustness and validate findings, an Expert Sub-group (n=16) was convened. This interdisciplinary group comprised distinguished professionals from Architecture, Engineering, Construction (AEC), and medical trauma management as shown in Table 1.

Data Analysis

Data analysis employed Python programming to operationalize the PACE framework—encompassing Planning, Analysis, Communication, and Execution—integrated with statistical tests such as Chi-Square and Cramer's V. These tests quantified associative strength between categorical variables, with Cramer's V values approaching 1 indicating robust correlations.¹³ Findings were communicated through data visualizations, including photographs, ensuring clarity and actionable insights. Word cloud helps contextualize moral injury by quickly identifying recurring themes in the literature and in respondents' responses.¹⁴

Limitation

Word count, biases such as CMB, attrition bias can only be minimized and not eliminated.¹⁵

RESULT

The quality of respondent as illustrated in Table 1, contributions of Chi-square values in Table 2 reveal distinct patterns but silent moral injury across subgroups (n=229). Students contributed the highest proportion (34%), driven by "Poor Remunerations" and "AI Support Awareness," highlighting concerns about financial insecurity and technology adoption.

Experts Sub-Group:
1. Arc. (Dr) Abubaka S, Salisu (PhD). FNIA, Former HOD, Department of Architecture, Amadu Bellow University. Chair, Nigerian Institute of Architects Library and Publication Committee-2013-15
2. Arc. I.S. Cookey-Gam, FNIA, Former Architects Registration Council of Nigeria South-South Representative/ General Manager, Rivers Sate Property Development Authority.
3. Engr Imoh Menim William, Chief Engineer Eresere & Co. Nigerian Ltd Supervised Faculty of Art Block and more project for Niger Delta University.
4. Engr. (Dr.) Fubara Dan-Jumbo (PhD) FNSE, Principal Consultant Former CBI/TSKJ Bonny LNG, Train 6 Project Officer.
5. Engr. (Dr.) Dan Horsfall (PhD) Department of Electrical Engineering, Rivers State University.
6. State Chapter Chairpersons of Nigerian Institute of Architects (NIA)
7. Prof. Aniekan Ekere, Orthopaedic Surgeon and trauma management experts, University of Port Harcourt Teaching Hospital/CEO Rehoboth Hospital.
8. Dr. I. Job, Consultant Anaestologist, University of Port Harcourt Teaching Hospital
9. Mrs (Dr.) I. Job, Head of Department, Physiotherapy Department, Rivers State University Teaching Hospital
10. Dr Dandyson Allison -Kulo, Federal Medical Center Yenagoa

Table 1. Section of Experts Sub-Group.

Item	Total Contribution	Experts (n = 16)	AEC Students (n = 74)	Professionals (n = 91)	Non-Professionals (n = 48)
Self-unforgiving, Derogatory Remarks	2.41	0.15	0.68	0.74	0.84
Witnessed and Involved in Harm	3.76	0.18	1.11	1.20	1.27
Inputs not Recognized	2.89	0.12	0.93	1.01	0.83
Devaluation, Demeaning	3.21	0.19	1.03	1.19	0.80
HSE Neglect or Inadequacy	6.55	0.31	2.11	2.62	1.51
Poor Remunerations	10.81	0.75	3.81	4.85	1.40
Lack of Career Development	1.27	0.05	0.51	0.59	0.12
Discrimination and Disrespect	6.62	0.45	2.40	2.88	0.89
Lack of Loyalty	2.21	0.11	0.82	1.00	0.28
Guilt, Shame, Frustration	2.89	0.18	0.96	1.01	0.74
Wrong Name Calling, Reduces Self-Worth	1.11	0.06	0.45	0.50	0.10
Resignation Due to Shame, Guilt, Regret	3.55	0.22	1.11	1.30	0.92
Reporting Unethical Practices	7.89	0.65	2.40	3.23	1.61
Loss of Sense of Dignity, Fulfillment	5.72	0.41	1.83	2.31	1.17
AI Support Awareness, AI Use, Blockchain	9.76	0.71	3.35	4.81	0.89
Total Contribution (subgroups)	70.66	5.54	24.00	30.24	10.88

Table 2. Distribution of Chi-Square Contributions by Sample Groups updated December 10, 2024

Hypothesis

- Ho: $uMI \leq 5\%$
- Ha: $uMI > 5\%$
- Chi-square (χ^2) total = 70.66, with degrees of freedom (df) = 14,

- Significance level (α) = 0.05, confidence level (CL) = 0.95, and p-value < 0.001.
- Cramer's V = 0.556

Professionals accounted for 43%, reflecting occupational risks with high inputs in "HSE Neglect" and "Witnessed Harm." Non-professionals (15%) emphasized "Discrimination and Disrespect," while experts (8%) focused on "Reporting Unethical Practices" and "AI Awareness." These variations demonstrate both shared and subgroup-specific moral injury concerns, emphasizing the need for tailored interventions across experience levels to address financial, technological, and occupational challenges in construction. Figures 1-5 present field insights.

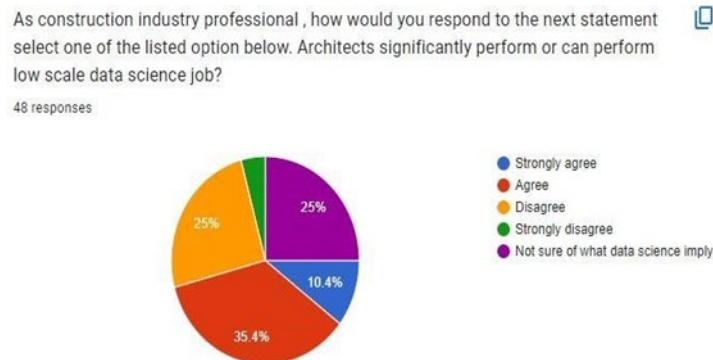


Figure 1. Knowledge Gaps and Identity Challenges in the Data Age: Nearly 50% of AEC Students and Professionals Are Unsure or Disagree That Architects Can Perform Low-Scale Data Science Tasks.
 From site inspections and measurements to space sizing and color selection, architects rely on numeric and thematic data collection and analysis to inform decision-making.



Figure 2. AEC Students' Distress & the Fear of Failure



Figure 3. Word Cloud of Recurring Themes from Literature and Respondents.
Credit: Mabel Allison

9. If you or a coworker were seriously injured on the job, and the construction firm did not take full responsibility for medical treatment costs, how would this make you feel? (Select all that apply)



16 responses

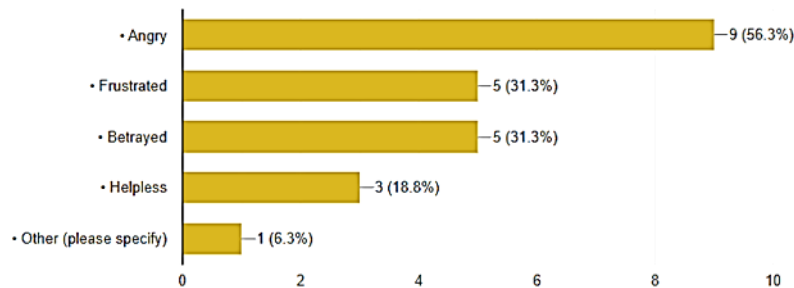


Figure 4. Experts view

From your experience which of these is likely to disinform students in order to take advantage of them? Chose three



75 responses

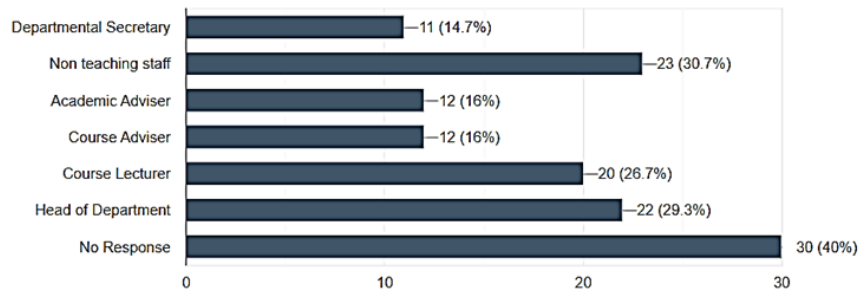


Figure 5. Students view

LITERATURE REVIEW

Brief description of MI three principal dimensions by Paulus Kaufmann's team, Sophie Oliver, and Center for Workplace Mental Health.¹⁶ are useful: (1) **Degradation**: The number of instances where individuals experience a decline in their well-being, skills, or status due to work-related factors. (2) **Dehumanization**: Instances where workers are treated as mere tools or commodities, disregarding their humanity. (3) **Humiliation**: Cases where workers feel demeaned, disrespected, or undervalued.

In 2013, over 1,100 people died in the Rana Plaza collapse in Bangladesh.¹⁷ In Nigeria, building collapses are frequent, with 2015 recording 90.8 fatalities with Nigeria's regional distributions of building collapse having South West fourteen times higher than South-South region.¹⁸ These incidents reduce individuals to mere statistics. Corruption, in tandem with poverty and excessive borrowing, contributes significantly to moral injury (MI) within the construction industry, necessitating the pursuit of good governance.¹⁹ Figure 3 contextualizes MI by identifying recurring themes such as guilt, betrayal, and ethical conflict. Nigeria's construction industry, one of the most corrupt sectors alongside the judiciary, undermines human dignity.

The global challenge of corruption, seen in industries in Australia and Bulgaria,²⁰ is aggravated by profit-driven corporate environments. These conditions create a perfect recipe for MI, despite human dignity being enshrined in documents like the UN Charter and the Universal Declaration of Human Rights significant knowledge gap exist.²¹ Examples include using trade labels instead of personal names, diminishing individual identity.

Scholars have expanded MI theories by identifying key aspects: (1) moral injury arises when transgressions threaten self-identity, (2) employees mitigate impacts through coping strategies,²² and (3) long-term consequences often result in withdrawal from harmful environments. Given the inevitability of moral transgressions, stress management and coping mechanisms are vital. MI interventions can be primary, secondary, or tertiary. Primary interventions address root causes, such as revising policies to prevent harm, while secondary and tertiary interventions focus on managing ongoing consequences, as evidenced by the aviation industry's response to moral injury linked to catastrophic crashes.²³ Protecting human dignity is essential, as highlighted in the 60th anniversary agenda of the Universal Declaration of Human Rights. Structural issues like poverty and organized crime further degrade individuals, compelling actions against their dignity.²⁴ Overcoming MI necessitates holistic governance and systemic reforms in construction and beyond.²⁵

Space and cost

The relentless reduction of living and working spaces, coupled with the financialization of housing and commodification of spaces, poses a profound threat to urban ecology and ecological reserves. Cities have become increasingly uninhabitable and sterile, despite their aesthetic allure marked by advanced materials and technological sophistication.²⁶ Crucially, the essence of urban vitality—its humanity—is being neglected— as illustrated in Figure 6. Consequently, cities and neighborhoods, including the species integral to ecosystems, are rendered unsuitable for habitation or productivity. Kaufmann and Oliver emphasize the moral injury associated with the erosion of both individual and spatial identity, asserting that “our cultural and natural heritage resources...are our touchstones, our points of reference, and our identity.”²⁷ Similarly, Jefferys et al. highlight the urgency of aligning construction priorities with human and ecological needs, underscoring the necessity of “Building the Homes We Need.”²⁸

Architects' roles, however, have become marginalized as the construction industry cedes leadership to unqualified actors. According to respondents, over 60% of contractors include inadequately rehabilitated ex-convicts, transforming the sector into a non-knowledge-driven domain. Architects, constrained by the demands of financiers and political interests, face diminishing influence, as depicted in Figures 6 from the study's survey. Marinic and Meninato, in *Informality and the City*, examine the

interdisciplinary implications of such trends, pointing to systemic inequities and diminished urban livability.²⁹ These shifts have driven some architects to adopt "rebellious" stances, prioritizing ethical principles and cultural preservation over complicit participation in morally injurious practices.³⁰ Their resistance highlights the imperative to ensure that architectural interventions enhance, rather than degrade, the cultural, ecological, and human fabric of urban spaces including builders.

Sustainability and cost

Among AEC students, exploitation manifests through mandatory purchases of handouts and books, contributing to significant attrition rates, particularly in architecture, where over 60% drop out before graduation supports architecture as most dissatisfied profession.³¹ The UNEP's WESR highlights the potential of AI and blockchain to improve identity management, ethical standards, and record-keeping practices in the sector. This is consistent with Dubai's construction industry; characterized by systemic exploitation, including passport confiscation, low wages, and the threat of deportation. These unethical practices are compounded by inadequate health and safety conditions, leading to frequent accidents and alarmingly high suicide rates. Between 2010 and 2011, 84 Indian workers lost their lives under such circumstances.³² However, to reduce environmental impacts and MI without worsening exclusion, hostile takeovers, or knowledge gaps, an in-depth understanding of future AI and blockchain standards is imperative. The challenge lies in balancing these advancements with the industry's pressing need for ethical labor practices and inclusivity. Enhancing construction governance must prioritize worker rights, safeguard students' academic well-being, and mitigate the pervasive systemic inequalities in the industry.



Figure 6. Conflicts in Shared Public Spaces: Motorists vs. Pedestrians and Identity Dynamics

DISCUSSION

The study on moral injury (MI) in construction highlights significant associations across key dimensions, including degradation, dehumanization, and humiliation. An updated dataset (December 2024) underscores the prevalence of MI factors among demographic subgroups, yielding a chi-square value of 70.66 ($df = 14$, $p < 0.001$) and a Cramér's V of 0.555, indicating moderate to strong relationships. Statistical findings reveal systemic barriers to reporting unethical behavior, affecting a substantial workforce segment. Key factors include shame and stigma (70%), peer judgment apprehension (80%), employment-related concerns (75%), and insufficient awareness of reporting mechanisms (46%). These insights necessitate targeted interventions within the construction sector.

Symptoms and Manifestation of MI

The study identified theft, distrust, workplace shame, fear, and unethical responsibility assumed by junior officers to shield superiors or firms, aligning with findings by Paulus Kaufmann and Sophie Oliver. These factors contribute to accidents, lost work hours, project delays, and significant cost implications, highlighting their adverse impact on workplace efficiency and ethical practices.

Digital Domain Impact

The research identifies critical manifestations of MI in digital environments,³³ particularly through:

1. Social media criticism: Instantaneous public scrutiny leading to professional reputation damage
2. Digital rating systems: Quantified performance metrics causing psychological distress
3. Privacy infractions: Unauthorized sharing of personal or professional information

The digital manifestation of MI demonstrates unique characteristics distinct from traditional workplace trauma. Social media platforms accelerate the spread of negative experiences, creating an amplification effect that can extend the impact of moral injuries beyond the immediate professional environment. Case studies, including the documented "Covid heroes" narrative,³⁴ illustrate how digital platforms can transform localized incidents into widespread professional trauma, particularly when combined with algorithmic content distribution and persistent online archives. Unfiltered public commentary affecting professional standing can result a level of MI. This may worsen with population doubling by 2050.³⁵

CONCLUSION

This research underscores the prevalence of moral injury (MI) within the construction sector, emphasizing its silent yet profound impact. The demonstrated correlation between organizational structures and MI highlights the critical need for systemic reform to address workplace ethics strategically. With urban populations expected to double by 2050, particularly in developing economies like Nigeria, ethical practices in construction are imperative. This study advances discourse, informs policy, and fosters interdisciplinary collaboration to promote workforce well-being and strengthen ethical integrity.

Recommendation

Ensure accurate identification and recognition with AI and Blockchain.³⁶ While a Blockchain policy has been signed with NITDA raising awareness and fostering interest in Blockchain technologies,³⁷ further steps—such as adapting and passing Blockchain legislation—are essential.³⁸ Victims' experiences must be thoroughly acknowledged to restore dignity and ensure meaningful representation beyond statistics.

- Develop Human-Centered Frameworks: Guide AI and Blockchain adoption and solutions using rigorous GBA Blockchain Maturity Modeling (BMM) blueprints,³⁹ integrating qualitative insights with quantitative data to humanize data interpretation and reflect the lived experiences of impacted individuals.
- Enhance Health and Safety Protocols: Implement robust safety measures through systematic auditing and comprehensive training programs to mitigate construction-related victimization. Now easier and faster to deploy and navigate the Blockchain risks. AEC education should be fun; not torture.⁴⁰

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LEARNING FROM OCONEE NUCLEAR STATION: RAMIFICATIONS OF INFRASTRUCTURE ON ARCHITECTURE AND PLACE

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INTRODUCTION

In the Piedmont region in the southeastern United States, a zone connecting Atlanta and Charlotte, urban areas have expanded 165% since 2009 and are expected to continue growing.¹ This area, known as “Charlanta”, is joined by the Interstate 85 highway and contains a large territory that includes Upstate South Carolina. Census data comparing the populations of the respective counties of Atlanta, Georgia; Greenville, South Carolina; and Charlotte, North Carolina also demonstrate significant increases in populations in the last twenty years. With the forecasted expansion and development to the region, there will be a need to create more housing for the influx of new residents, and with that increase in housing will come a need for increased energy production. This development of energy infrastructure will inevitably generate consequences in landscape, economy, and architecture. Looking to previous major infrastructural developments as case studies is a starting point for understanding the complex and interwoven ramifications of such projects.

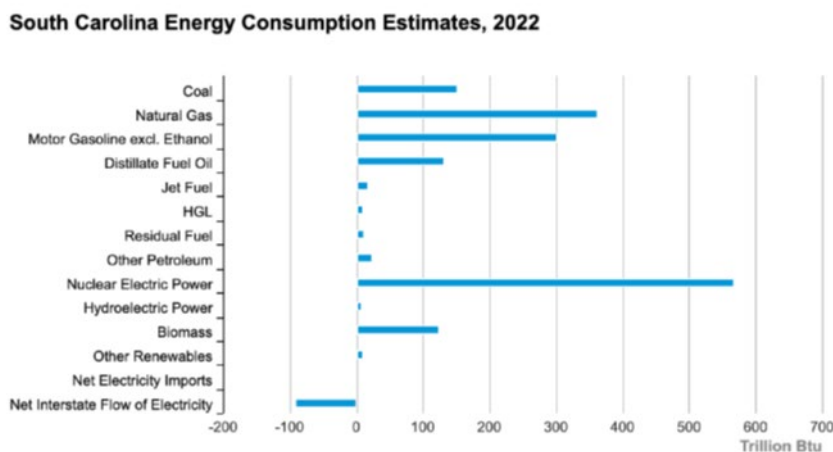
An examination of the existing energy infrastructures indicates that South Carolina specifically is powered through energy generation primarily via nuclear Power, natural gas, and coal, as is shown in Figure 1. With initiatives such as the Biden Administration’s Infrastructure Investment and Jobs Act in the Fall of 2021, which pledged over 73 billion dollars towards investment in clean energy transmission² and the Inflation Reduction Act in the Summer of 2022, which supplies \$370 billion on a multipronged approach to energy access and clean energy generation and solutions,³ it can be anticipated that the future infrastructural development of South Carolina will focus on clean energy production. Given the growing populations of the state and region and the exigency of responding to the climate crisis, the state and its relevant stakeholders can take advantage of these national initiatives.

In theory, the notion of expanding clean energy technology is positive, helping to reduce carbon emissions and limit environmental damage. However, it can come with a caveat. Isabelle Anguelovski et al discusses this in her work about the unintended negative ramifications of some climate-adaptive infrastructures and initiatives:

“More recently scholars have pointed at the so-called green space paradox, by which seemingly laudable municipal strategies of restoring degraded urban environments, creating greenspace, or deploying climate-adaptive green infrastructure improve an area’s attractiveness while resulting in increased property values, housing prices, and physical displacement of working-class residents and racialized

groups and cultures – ultimately serving as a gentrifying force through a process known as green gentrification, environmental gentrification, or climate gentrification.”⁴

In this paper, Oconee Nuclear Station in Oconee County, South Carolina is considered as a case study to examine how the implementation of a green infrastructure in Upstate South Carolina exhibits aspects of green gentrification in the ramification on landscape and architecture that followed the construction of the nuclear power plant.



Source: Energy Information Administration, State Energy Data System

Figure 1. South Carolina Energy Consumption by Source, 2022⁵

BEFORE OCONEE NUCLEAR STATION

Cherokee people lived in the lands along the Keowee River in the region that is now considered part of Upstate South Carolina dating back to at least 1539. Within this context at the foothills of the Appalachian Mountains, a central village known as Keowee Town or Keowee Village was a large settlement that extended for several miles outward from the area identified as the Keowee River Valley.⁶ In the 18th century, British colonizers built Fort Prince George in this region. According to Pickens County Historian Dennis Chastain, the fort in this strategic location played a critical role in the region’s history as it helped to secure an alliance between the British and the Cherokee and also helped keep the French from gaining control of this section of colonial America.⁷ These sites now sit 150 feet below the surface of Lake Keowee as a part of the construction of Oconee Nuclear Station and its hydroelectric dam.

In later centuries, the fertility of the land, as well as the easy access to water, gave way to the development of the Oconee County region into a context of small farms and textile mills. An examination of the Farm Plat Book and Business Guide for Oconee County South Carolina from 1953, approximately a decade before the construction of the power plant, provides some insight on the farming culture and economy of the context. In this era, 58% of the county’s 428,800 acres were considered farmland.⁸ The county population per the 1950 census was 39,050.⁹ Thus, the water that had sustained life for indigenous peoples and then for European colonizers later sustained local agriculture and traditional southern ways of living.



Figure 2. View of the Keowee River in 1967 before the construction of the hydroelectric dam and Oconee Nuclear Station¹⁰



Figure 3. The Pleasant Alexander House, from the 19th century, on the west side of the Keowee River. The house is an example of Southern Vernacular architecture.¹¹

Archival photos show that common building types in area later flooded by Lake Keowee included typical southern vernacular architectures. Homes like the Pleasant Alexander House, building during the 19th century on the west side of the Keowee River, are representative of typical housing typologies of the area¹² – the large front porch served as an interstitial space between the private interiors and the public realm. Other structures beyond houses included simple barn structures that prioritized functionality and efficiency over ornamentation or scale.

KEOWEE TOXAWAY PROJECT AND OCONEE NUCLEAR STATION HISTORY

Oconee Nuclear Station is located in Seneca, South Carolina and is the largest of the five nuclear plants within the state of South Carolina. It has been operational since 1973. It features three nuclear reactors and generates enough electricity to power over 1.9 million homes in the region of Upstate South Carolina.¹³ While nuclear power plants were not originally designed to be operational for more than a few consecutive decades, in 2021, Duke Energy applied to keep Oconee Nuclear Station running until at least the 2050's.¹⁴

Oconee Nuclear Station was developed as a part of the Keowee-Toxaway Hydroelectric Project. Duke Power began buying the land that would facilitate the construction of the power plant and the damming of the river as early as the 1940's.¹⁵ In the late 1960's, the Keowee River was dammed to construct Lake Keowee, which would serve as a critical part of the infrastructure of Oconee Nuclear Station. Lake Keowee spans 18,500 acres and has over 387 miles of shoreline, making it a significant undertaking in the landscape.¹⁶ Beneath it lay the archeological sites of the Cherokee villages and of Fort Prince George, as well as much of the farmland and supporting homes and vernacular structures. A massive deforestation effort was also required to protect the nuclear plant in what was one of the largest land-clearing projects in the history of the Carolinas.¹⁷ Since its construction, the water from the lake is used both to generate hydroelectric power via a dam and to providing cooling for the nuclear reactors.

AFTER OCONEE NUCLEAR STATION

The construction of Oconee Nuclear Station and specifically Lake Keowee reshaped Oconee County, as it has shifted from an agrarian and rural context rich in networks of rivers and streams to a suburban and developed environment with a cluster of lakes. As of 2020, the population has doubled from it's 1953 data, with the county housing 78,607 residents.¹⁸ The rural, agricultural past of the county has also largely been lost with the reduction of farmland for the lake's construction. Today, per the United States Department of Agriculture Survey in 2022, there are 61,599 acres of farmland remaining in the county, less than one sixth of the total agricultural land in the 1950's.¹⁹

Property ownership data per qPublic, the interactive public access Geographic Information System portal for Oconee County, reflects the high degree of privatization of the lakefront property. Even South Cove County Park, a popular destination for kayaking and boating that is accessible to the public during daylight hours, is legally owned by Duke Power Corporation, not the county.²⁰ Concerns about this privatization are reflected in the book *Images of America: Oconee County*, which details the local history of Oconee County. Piper Peters Aheron, an author and regional historian, notes that with the development of the often private lakefront communities that "... these independent communities restrict county resident access as a whole, but doubtlessly, Duke Energy added much to the overall economy of the upcountry," reflecting the conflicting sentiments of long time locals.²¹

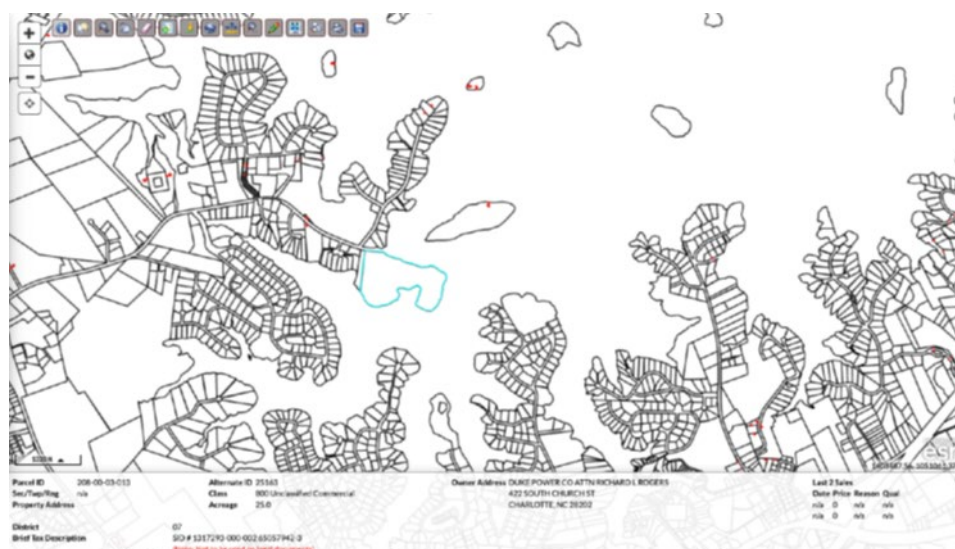


Figure 4. An Image from qPublic showing that South Cove County Park (noted with the blue outline) is privately owned by Duke Power Company.²²

Beyond the fact that the lake is privately owned, the data showcases that this ownership is only accessible to the area's affluent population. Parcels of land in one of today's prominent subdivisions on the lake were offered at \$6,000 a parcel in 1968, before the shoreline was visible. Adjusted for inflation, the cost of a parcel today would be approximately \$55,000. Today, these same lots often sell for over \$300,000.²³ Per 2020 data from a local realty group, the median price of a home on Lake Keowee is \$746,500,²⁴ while the median value of owner-occupied housing in Oconee County as a whole between 2018 and 2020 was \$192,800.²⁵ This dramatic difference in housing cost at the lake compared to the average housing costs in the county reflects the gentrification of the lakefront.

Architecturally, this gentrification has not led to elevated design that suits the context. The historic locales, farmland, and southern vernacular constructions prominent until the construction of Lake Keowee have been replaced with large homes that are antithetical to both the context and the international style and can be argued as epitomizing "McMansions." This term, used to describe a large, multi-store house that prioritizes superficial appearance and sheer scale over quality, was first adopted in the 1990's in the Los Angeles Times article "Search for Environmental View of Design" by Sam Hall Kaplan and has since been discussed in architectural dialogue and popular media.²⁶

Figure 6. An aerial photo of the home known as 'The Castle' on Lake Keowee²⁷

As architectural critic Kate Wagner describes in her website "McMansion Hell", McMansions tend to have certain tenants in common, including an excess of secondary masses, a lack of balance amongst the home's composition, a lack of rhythm to façade organization, and irregular proportions of elements.²⁸ Through the analysis of real estate listings of homes in the context, one can find many homes of enormous footprints that lack evidence of design principles, functionality, or contextual considerations. Homes such as "The Castle", a private residence that sits upon three prime lakefront lots, serve as a demonstration of wealth through flamboyant exteriors and grandiose proportions in lieu of high design. The interior of The Castle has never been completed nor has the house been occupied²⁹ – in this way, the house literally demonstrates the absence of livable qualities while metaphorically communicating the lack of substance to McMansions as designs and as places.

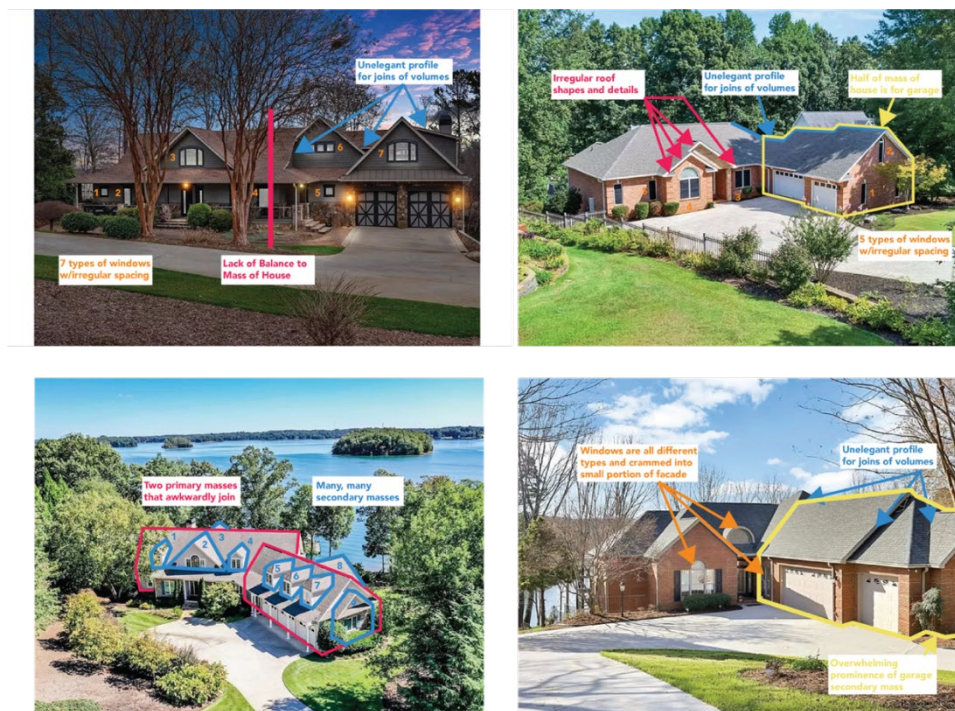


Figure 7. Images of homes on the south side of Lake Keowee demonstrate the flawed design principles described by Kate Wagner's McMansion Hell. Images made by the author from Zillow listings photos

AFTER OCONEE NUCLEAR STATION

How can the successes and shortcomings of the development surrounding Oconee Nuclear Station be used to better inform future infrastructural implementation in a context? Based on the analysis of the history and subsequent development, possible action items for future projects include ensuring public property rights to landscapes created within projects that generate desirable amenities; creating partnerships and dialogue with community members and groups at the outset of infrastructural projects; the development of social or affordable housing; and the limitation of privatized critical infrastructures or the creation of public utilities.

Public Property Rights to Landscapes

One of the major critiques of the development of terrain around Lake Keowee and the Oconee Nuclear Station is that the new coastline of Lake Keowee has been privatized in a way that makes it inaccessible to the public except in small, limited sites. Many sites used by the public are still technically not public lands and are privately owned by Duke Power Company and are used by the public at the discretion of the property owners.

A successful precedent that demonstrates how this may be implemented is the various undertakings of the Tennessee Valley Authority in the United States in the mid-20th century. To create a series of hydroelectric dams in Tennessee and surrounding states, the Tennessee Valley Authority had to create lakes and subsequently new coastlines.³⁰ Some of these coastlines face similar issues of gentrification and privatization to that which Lake Keowee has experienced, but a key difference is that with the construction of the lakes, numerous state parks were developed. These state parks provide public lakefront access, picnic areas, hiking trails, and other outdoor recreation, democratizing access to some parts of the water. Legislation or agreements that mandate the creation of such parks with the

development of major infrastructure projects helps to address this aspect of the inequity of green gentrification.

Community Partnerships and Dialogue

Duke Energy spent decades planning the development of Oconee Nuclear Station but did not make the plans for the infrastructure known to the larger public until the major decisions were already settled. The Keowee Toxaway Project was planned for decades but without public knowledge until a press conference was held at Clemson in the 1960's.³¹ In contrast, partnerships and dialogue with community members and relevant community groups can help ensure public buy-in to infrastructural developments and build lasting trust between constituents and governments or other groups. This has been found to be especially helpful in even the securing of infrastructure investments for disadvantaged, unincorporated communities (called DUCs).³² Various foundations have gone as far as to champion initiatives, such as the Community Connectors program³³ that support collaborative and community-based infrastructural approaches within realms of civic or transportation infrastructure. The World Economic Forum has also acknowledged that because implementing clean energy will require more land use, there is a need for high levels of community engagement for future energy transitions; a white paper published in 2023 supports that public engagement with the transition to clean energy infrastructure can build value for communities with a “people-positive” engagement strategy that gives members buy-in and opportunities for input.³⁴

Development of Social or Affordable Housing

As demonstrated earlier, the cost of home ownership on Lake Keowee is more than triple the median cost of housing within the county; McMansions are the norm, while apartment rentals or more affordable housing options are almost nonexistent based on 2024 real estate listings, demonstrating a need for housing at accessible prices in the vicinity of the lake.

The standards of affordable housing legislation vary significantly in different contexts. Within the State of South Carolina, affordable housing legislation is currently adopted only in a voluntary manner. Municipalities with over fifty thousand residents may adopt a voluntary inclusionary housing policy that requires designated units or structures for affordable housing or establishes sale or rental prices.³⁵ This legislation is lax in its requirements but if communities that are to be future home to infrastructural undertakings have the foresight and initiative to implement such policies before the creation of amenities such as new coastlines, this can help to ensure that not all housing that is subsequently developed is inaccessible in price. More ambitiously, robust policy changes at state or federal levels, such as the Solidarity and Urban Renewal Law in France, could help to limit gentrification in a wide range of contexts as well.

Limitations to Privatization of Infrastructure and Creation of Public Utilities

Currently, in Upstate South Carolina, access to electricity is controlled by the monopoly that is Duke Power Company. This private entity is the only way residences and business can obtain electricity without generating their own power on-site. Thus, Duke has substantial power in decision making regarding the future of electricity generation and access in this region without the need to hear or receive public input, as they did with the development of Oconee Nuclear Station. The undertaking of such a project would not be covert or unknown to the masses in a public power utility organization. In such arrangements, power utilities are owned by a community and operated in a manner similar to that of local governments.

This organization structure already exists in some locales in the United States. The American Public Power Association is an organization of not-for-profit, community-owned utilities that currently serves

over 2,000 towns and cities in the United States that successfully utilize public power utility structures.³⁶ This gives citizens a direct voice in utility decisions regarding infrastructural development and its ramifications, which in turn could prevent unilateral or surprise pronouncements that come with private enterprise.

CONCLUSION

Infrastructural growth is imminent in not only Upstate South Carolina but also in the larger Charlanta region and beyond. Given this, an examination and critique of Oconee Nuclear Station and its ramifications serves as a useful guide and, in some cases, a caveat of the complex consequences the construction of an energy infrastructure can have on a context. Landscapes, land uses, populations, property values, and contextual architecture were all transformed in the decades that followed the opening of the nuclear power plant in Oconee County. Access to energy was improved throughout the region and economically the county advanced and grew thanks to the actions of Duke Power. However, green gentrification has led to privatization of access to amenities created as a consequence of the infrastructural development. Furthermore, the power company still holds tremendous authority related to decision making on infrastructure and its surroundings in a way that does not necessarily invite public engagement. Through both planning and policy measures such as requiring community engagement, providing public property rights to landscapes created with infrastructural projects, enactment of affordable housing policies, and a push for public utilities, some of the equity issues generated in infrastructure projects of days past, like with Oconee Nuclear Station, can be prevented in future sustainable development.

NOTES

- ¹ Adam J. Terando et al. "The Southern Megalopolis: Using the Past to Predict the Future of Urban Sprawl in the Southeast U.S. *PLoS ONE*, 9(7): e102261. doi: 10.1371/journal.pone.0102261
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THE RESEARCH ON THE CONNECTION BETWEEN GREEN SPACE, RESILIENCE AND HEALTH AGAINST THE CONTEXT OF PANDEMIC

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INTRODUCTION

54% of people live in cities nowadays and expected rise to 70% by 2050.¹ While urbanization brings benefits like economic growth and regional productivity,² its negative effects have grown more noticeable, such as growing inequity,³ climate change,⁴ epidemics,⁵ and so on.

When facing inevitable climate change, inequity phenomenon, and heat island effect brought by urbanization,⁶ epidemics seem to outbreak more frequently. Actually, the metropolis has already become the incubators of epidemics with the urbanization process.⁷ The World Health Organization (WHO) had proclaimed 6 epidemics to be the public health emergencies of international concern (PHEIC) in this decade.⁸ Bill Gates said in a public speech at TED: "The greatest threat to humanity in the future is the pandemic."⁹ According to the 2007 World Health Report, rising worldwide urbanization is a threat to 'Public Health Security,' since the unprecedented level of population agglomeration may accelerate the spread of epidemic diseases.¹⁰ Therefore, increasing the city's resilience facing the epidemic in the future and establishing the pandemic-resilience city become important for future development.

Coronavirus, which has lasted for more than two years until now, has a tremendous influence on social, economic, political and environmental aspects.¹¹ It seriously threatens world public health security,¹² more than 418,650,000 confirmed cases have been reported worldwide as of 19th February 2022,¹³ one half of the world's population has been required to stay home as much as possible. It also highlighted there is a lack of basic capacity to respond to emergencies and disasters.¹⁴

The main means that most countries used when facing the coronavirus have been the closure of collective activity, distance, mask, vaccine, etc.¹⁵ But most of these are short-term interventions. The research on the medium-term and long-term interventions that could increase urban pandemic resilience as well as other environmental issues is part of the most important issues for us to research now and in the future.

Urban planning has been related to public health for years, in fact, the concern for public health is one of the main driving forces for the development of modern urban planning. From 1831 to 1832, the outbreak of cholera led to a series of investigations, one of them being Edwin Chadwick who believed that the air from garbage and excreta lead to the epidemic.¹⁶ In 1848 "UK enacts public health act" was approved by the UK congress,¹⁷ and the urban water system was rebuilt in London for controlling the spread of cholera. In 1878, Doctor Benjamin put forward the model for establishing a healthy city, the

“garden city” then proposed by Howard who wish to build a healthy urban and rural environment with urban planning methods, such as reasonably distributed population and green spaces, which also became a symbol of the birth of urban planning. It can be seen that developing a future urban planning strategy is one of the methods of medium-term and long-term intervention.

As part of urban planning intervention, greenspace plays an important role in this epidemic. The activities in greenspaces increased dramatically after the outbreak of covid and unblocking policy.¹⁸ With activities increased in greenspaces, there are also problems such as lack of distance, and this phenomenon could increase the risk of infection in the meanwhile. It’s obvious that the COVID-19 revealed the weakness and highlighted the importance of existing urban open and green spaces.¹⁹ Numerous studies have demonstrated that access to green spaces can lead to various health benefits, include physical, mental, social health²⁰ and environmental health (heat, air pollution, noise). Specifically, quality of UOGS, the density of vegetation, tree canopy cover, spending time in UOGS, size and visibility have been provided as links with resilience and health. For example, Soga Masashi proved that the people who have a green view outside the window have better resilience in mental health during the lockdown period.²¹ The pathways through which green spaces influence health outcomes have been summarized in previous studies into four general pathways: air quality, physical activity, social contacts, and stress reduction. Subsequent research has further categorized these pathways into three main categories: harm reduction, capacity building, and restorative capacities, which includes the four pathways and consider more environment aspect.²² In the harm reduction category (mitigation), green spaces contribute to reducing exposures to environmental stressors such as air pollution, noise, and heat. In the building capacities (instoration), green spaces encourage physical activity and facilitate social cohesion. Lastly, in the restoring capacities category (restoration), green spaces could benefit to attention restoration and psychophysiological stress recovery.

The emergence of COVID-19 has brought renewed focus on the vulnerability of urban areas to pandemics. In response to this crisis, understanding how to build and enhance pandemic resilience is indispensable. Urban resilience has conventionally been defined as the "measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming towards sustainability".²³ However, pandemics are one of the threats often overlooked. These complex issues, or weak problems, cannot be solved immediately; instead, more problems tend to arise over time. The outcomes of these efforts are not simply right or wrong but are instead judged on a spectrum of effectiveness.

Given this complexity, it is crucial to focus on response, adaptation, and preparedness for such threats.²⁴ This underscores the importance of the resilience concept, not only for epidemics but also for other environmental issues. Resilience has been widely used in contexts such as climate change and floods, where green spaces significantly mitigate heat and manage surface water run-off.

Pandemic resilience strategies can be categorized into three levels: prevent, protect, and prepare and adapt.²⁵ "Prevent" involves reducing the infection rate and alleviating stress on public health systems, focusing on risk reduction before widespread issues arise. "Protect" pertains to measures during the active phase of a pandemic, such as quarantine, lockdowns, and social distancing, aimed at preventing transmission. "Prepare and adapt" addresses both immediate responses and long-term recovery, including improvements in management and healthcare facilities.

Similarly, green spaces can enhance urban pandemic resilience. Exposure to green spaces can bolster resilience and support mental health by reducing stress and improving mood. Green spaces provide a setting for maintaining well-being while facilitating social distancing. They can also serve as flexible spaces for temporary hospitals, as seen with Huoshenshan and Leishenshan hospitals in Wuhan, China, as well as for epidemic detection points and vaccine sites. This versatility contributes to the

characteristic diversity or redundancy essential for resilience. Overall, green spaces are crucial for developing pandemic resilience.

Despite advancements in research, a gap remains in understanding how specific green space indicators link to different levels of pandemic-resilience strategies, namely prevention, protection, and adaptation. Green space has often been studied alongside other urban indicators such as land use, GDP, and household income, but limited research focuses specifically on its effects and indicators. Without this connection, the concept of green space as a tool for pandemic resilience tends to remain a slogan rather than a practical guide for building healthier cities.

To address this gap, this study combines a systematic review with an integrative review of existing literature, aiming to identify missing pathways and benefits and to connect green space indicators with the three levels of pandemic-resilience strategies.

METHODOLOGY

This research method combines a systematic review with a review of a specific topic. The steps of the research method are followed:

- a) A systematic review was conducted by searching for the terms “green space”, “health”, and “measure” in Scopus, only relevant subjects were selected, with papers written in English and published from 2018 onwards. This timeframe includes the period after the outbreak of covid-19 at the end of 2019 as well as almost two years prior, to provide a broader perspective on the research. After reviewing the titles and contents of the papers, articles that did not explore the relationship between green space and health, did not evaluate health using green space indicators, lacked full-text access, or had health outcomes unrelated to epidemic resilience were excluded.
- b) The results were reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.²⁶
- c) The results of greenspace measurements and health outcomes were then combined with the findings from papers that summarized the pathways of green spaces to health outcomes (reduction of harm, capacity building, and restoration capacity)²⁷ and papers that categorized pandemic resilience into three levels (prevention, protection, preparation, and adaptation).²⁸ This analysis identified any missing pathways and benefits, and determined which greenspace indicators are connected with the three phases of pandemic-resilience strategies.
- d) The researched data was input into RAW Graphs for visualizing the outcomes.

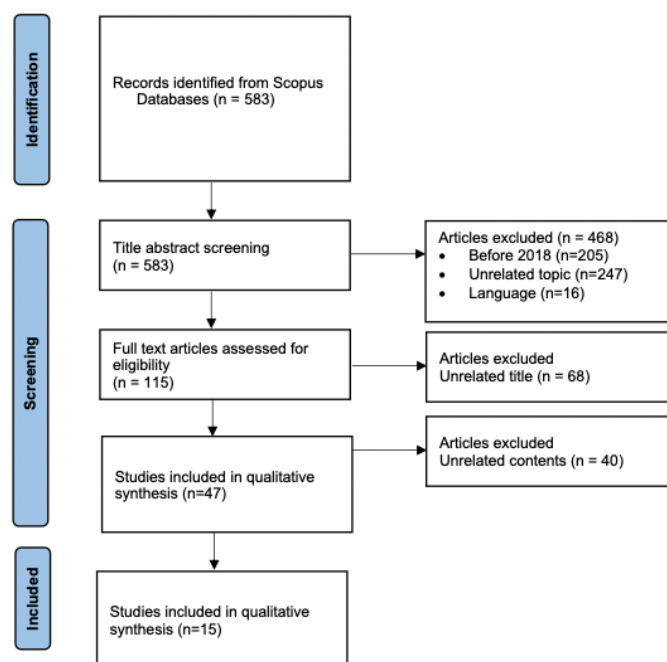


Figure 1. Flow diagram of the selection process (PRISMA)

RESULTS

Through systematic research and literature review, the connection between greenspace measurement indicators, pathways to health outcomes, pathway categories, health outcomes and pandemic-resilient strategy has become clearer. Greenspace measurements include green space area, green space qualities (such as frequency of maintenance and cleanness), nature elements, distance to greenspace, percentage of green space in a circular buffer, Normalized Difference Vegetation Index (NDVI), patch area, etc. The pathway to health outcomes includes heat, air pollution, noise, biodiversity in reduction harm aspect; encouraging physical activity, facilitating social cohesion in building capacities aspect; attention restoration, psychophysiological stress recovery in restoration capacity; and other factors such as access to food, equity distribute and transmission control. These pathways impact both on humans and the environment, leading to various health outcomes, including isolating contagious animals,²⁹ reducing testing positive chance,³⁰ controlling pollution sources,³¹ improving mental health and social wellbeing, enhancing the immune system, improving nutritional status, and promoting health equity, most of these outcomes contribute to enhancing resilience both in the stages of prevention, protection, preparation and adaptation.

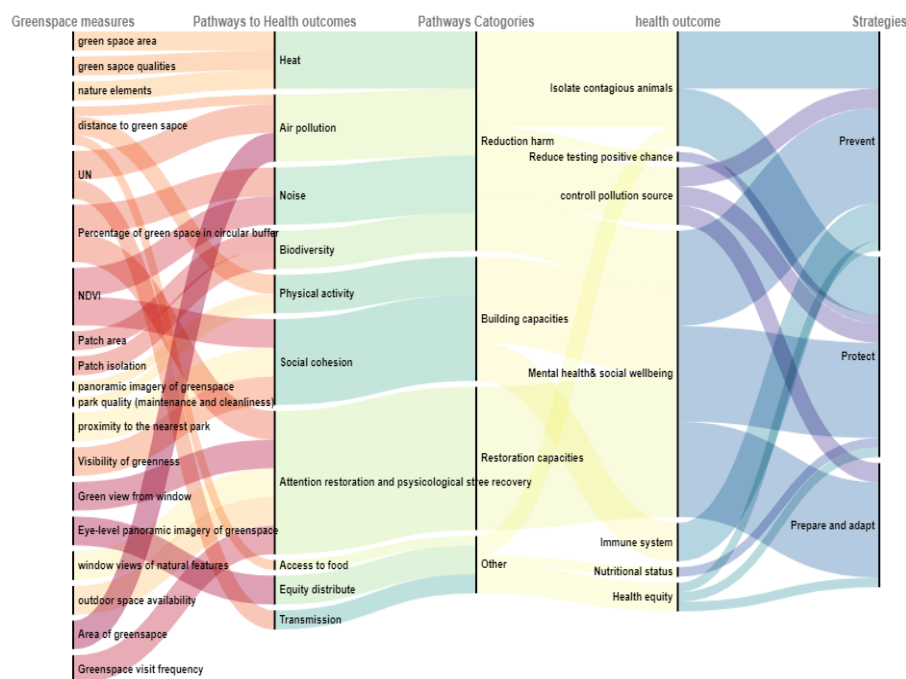


Figure 2. conceptual framework on the relationship among greenspace measurements, pathways to health outcomes and health outcomes related to three periods of epidemics (UN: Unnecessary)

DISCUSSION AND CONCLUSION

The main functions provided by green spaces could be divided into three parts as Markevychab claimed:³² Reduction harm, building capacities (also known as instoration), and restoration. These functions can be understood simply as benefits of green spaces on environmental aspects, physical and social health, and mental health. When researching the connection between greenspace measurement and health, three additional effects emerge in the selected papers that are not defined within the original framework: equity distribution and access to food which is related to health equity, and transmission effect which could benefit isolating contagious animals.

Those three pathways to health (equity distribution, access to food, transmission) are especially important during epidemics. For example, research has shown that low-income communities often face a higher risk of infectious diseases due to lower accessibility to nearby greenspace and poor living conditions.³³ Another study found that a higher ratio of green spaces at the county level is significantly associated with a lower racial disparity in infection rates.³⁴ This indicated that green spaces could impact the equitable distribution of resources, which is related to health equity and environmental justice issues. Disinvested urban areas contribute to health inequities by limiting access to quality green spaces, worsening disparities in outcomes like COVID-19. Increasing green space in low-income neighborhoods can improve air quality, enhance community safety, and reduce racial and ethnic inequalities in accessibility and usage.³⁵

The food supply chain is an important issue in a time of crisis, and access to food through productive greenspace such as urban farms, community gardens, edible forest offer sustainable solution to food security. A European study found that home food gardening increased by 10% during the COVID-19 pandemic,³⁶ highlighting the growing role of local food production. Well-designed green spaces not only support biodiversity but also provide access to healthier, sustainable foods like fiber-rich fruits and

vegetables. In low-income urban areas, these spaces can help alleviate food deserts and food swamps, improving nutrition and reducing health disparities.³⁷

Regarding transmission, green infrastructure like green roof could reduce the number of mosquitos, thereby isolating contagious animals and reducing the risk of infection.³⁸ This is beneficial during both the prevention and protection phases of an epidemic. There are differing conclusions regarding this point. Some studies suggest that higher accessibility to public green spaces may increase transmission risks,³⁹ while others indicate that if mobility is necessary, outdoor parks are safer than other forms of movement and activities.⁴⁰

After reviewing the literature, we extend the concept of three greenspaces pathways into four categories with the context of COVID-19 and consider health outcomes across three phases of an epidemic. The extended concept is as follows: Reduction harm (air pollution, noise, heat, biodiversity), Building capacities or Instoration (encouraging physical activity, facilitating social cohesion), Restoration capacity/restoration (attention restoration, psychophysiological stress recovery) and other factors, including access to food, equity distribute, and transmission.

There is limited research on the correlation between heat, green space, and epidemics, even though it is well-known that green spaces have positive effects on reducing heat, and that climate change is related to epidemics. To clarify this further: green spaces help reduce heat caused by climate change and urban heat islands; heat islands, which are largely influenced by urbanization, are related to the spread of epidemics;⁴¹ and heat can affect the habitats of wild animals like mosquitoes and bats, which are closely linked to epidemics.⁴² Therefore, when examining the impact of green spaces on pandemic resilience, existing research on the role of green spaces in climate change resilience can also be relevant. However, the effects of green spaces on heat and the relationship between climate change and epidemics have typically been studied separately,⁴³ and exploring this connection could be a valuable direction for future research.

Although this study attempts to categorize greenspace effects and their related health outcomes into three phases of an epidemic (prevention, protection, preparation, and adaptation), it's clear that green spaces benefit all three levels of pandemic-resilience strategies. For instance, isolating contagious animals is mainly useful for prevention and protection, while reducing the likelihood of testing positive is crucial during the protection phase. Green spaces can also control pollution sources, which is beneficial across all three phases. Additionally, green spaces play a significant role in mental health and social well-being, which are essential after the outbreak of an epidemic. Due to lockdowns, stress, and other factors, people's physical, mental, and social health deteriorate, and green spaces can help improve mental health and rebuild social cohesion, thus contributing to all three phases. Furthermore, green spaces can boost the immune system, as features like green views on streets or sidewalks, well-maintained parks, and proximity to green spaces encourage physical activity, which strengthens the immune system and enhances resilience during an epidemic. Nutritional status, linked to access to food and measured by proximity to green space, also strengthens resilience during the protection phase. Lastly, health equity is a crucial aspect, as equitable distribution of green space can reduce the risks faced by low-income communities with limited access to these spaces, thereby enhancing the resilience of individuals, communities, and urban areas when responding to environmental injustice.

This research, which selected only fifteen papers to identify main measurements of greenspace and health outcomes, may not cover all potential measurements. Some measurements indicators could be related with more than one effect, and future research could focus on identifying these indicators and their primary applications. Additionally, the subjective categorization of health outcomes into three epidemic phases (prevention, protection, preparation and adaptation) may not be entirely accurate, as it is difficult to define the specific boundaries of each phase. However, it is clear that green space benefit all three phases.

While this research focuses on infection diseases, many other pathways to different health outcomes were not explored. The relationship between the benefits of green space and health outcomes is complex system rather than a collection of separate aspects. For example, mental health and physical health are interconnected, and biodiversity is also related to heat. This research chose to focus on one or two aspects, but a system thinking approach could be valuable for future work.

In conclusion, this research strengthens the potential correlation between climate change, green space, and health. A future survey on maximizing the effect of greenspace on health and pandemic-resilience could build on the results of this study. This research reevaluates the pathways of green space to health and established connections between green space measurement, health pathways and infection disease-related health outcomes. It provides valuable insights for future research on the relationship between epidemics and greenspaces.

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LIVABILITY, BELONGING AND FEAR: FUTURE CITIES IN LIQUID MODERNITY

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INTRODUCTION

What is the future of “city” in a rapidly changing, liquid, interconnected, globalized world, whose inherent uncertainty creates for many, if not most, “an atmosphere of ambient fear”?

This paper explores the concept of *liquid modernity* as a basis to critique contemporary politics and rhetorics of resilience, and proposes ways to counter the forces of neoliberal and necroliberal capitalism that are currently well served by the spatial design and planning professions and disciplines under the guise of superficially benign concepts and rhetorics of “sustainability” and “resilience”.

LIQUID MODERNITY AND LIQUID FEAR

Polish sociologist Zygmunt Bauman describes that “the dominant sentiment is the feeling of uncertainty – about the future shape of the world, about the right way of living in it, and about the criteria by which to judge the rights and wrongs of one’s way of living. Uncertainty is not exactly a newcomer in the modern world, with its past. What is new, however, is that it is no longer seen as a mere temporary nuisance which, with due effort may be either mitigated or completely overcome. The postmodern world is bracing itself for life under a condition of uncertainty which is permanent and irreducible.”¹

His concept of “liquid modernity”² describes our current “liquid society” as characterized by instability and ambiguity and by the erosion or altogether disappearance of what appeared to be stable or solid categories of identity. This liquidity affects the very concepts and practices of territoriality and belonging, and their spatializations. Rapid change is operating at a speed and scale that social patterns and institutions, and even place itself, no longer have time to respond and provide solid and meaningful bases of human identity and collective action.³ Even systems of power are perceived as less stable and often elusive when one tries to engage them. As Manuel Castells suggested, “the flows of power generate the power of flows, whose material reality imposes itself as a natural phenomenon that cannot be controlled or predicted... People live in places, power rules through flows”.⁴ While power has concentrated in elusive and largely inaccessible global networks (“spaces of flows”), the actions of people and groups that are not closely associated with hegemonic power are increasingly circumscribed in localities (“spaces of places”).⁵

Bauman sharpens this point by stating that “power rules because it flows, because it is able (beware ever forgetting it!) to flow – to flow away”.⁶

Speaking truth to power, holding hegemonic and elusive systems accountable or counteracting their policies and actions then needs to return power “to its foundations in substantive landscapes, and (...)

that the political is practiced in places, counteracting the capacity of power to disengage from place and people and generate fear and uncertainty.”⁷ While arguably this is exactly what movements such as Black Lives Matter, or the movements addressing climate change, are attempting to do, they are simultaneously combating and playing into liquid fear. Liquid fear is generated by endemic uncertainty and severely impacts our ability to engage in meaningful social action to produce a viable future. Liquid fear is without obvious source, derivative and based in an internalization of “a vision of the world that includes insecurity and vulnerability.”⁸

Liquid fear has been used by state actors and other hegemonic elites to ensure compliance and social passivity from its citizens, as the state is not able to deliver on its promise to protect people. The social stability on which the state’s claims rely has been worn away by the uncertainties of global capitalism, and the inherent inequities of this system have generated a milieu of physical threats to personal safety, for example “in the form of so-called terrorist violence.”⁹

SUSTAINABILITY, RESILIENCE AND LIQUID FEAR

I argue that values such as resilience are operating as rhetorical devices and spatialized means to pursue agendas that are ultimately more about the resilience of the status quo with all its inherent and intrinsic injustice, inequity and uneven development, and less about addressing the very processes and actors that form most of the root causes of ecological, economic and social vulnerability and precarity.

The push for “resilience” and its impacts on the design, planning and performance of cities in general, and disenfranchised, marginalized and vulnerable neighborhoods and communities in particular (e.g. “green gentrification”), concluding that the expertist-apolitical stance of relevant professions and disciplines needs to be changed, and that consensus-driven design and planning methods and methodologies should be amended, or even replaced, by those that engage dissent in new, more inclusive and equitable ways, such as those based in assemblage theory¹⁰ or pluralistic agonism.¹¹ It presents the foundations for urgently needed counter-rhetorics that challenge the agendas of neoliberal governmentality and globalism in a pandemic and post-pandemic world.

Probably the most prevalent buzzword in discourses on urbanity and contemporary and future city, aside from “sustainability”, is “resilience”. While it has been around for a while, it has certainly had a resurgence, and is now (or at least in the aftermath of natural disasters such as hurricane Katrina and climate change in general) applied liberally outside of the disaster recovery community. Robert Olshansky, in his ambitious analysis of the post-disaster planning and recovery efforts post-Katrina; appropriately titled “Clear as Mud,”¹² considered the dilemmata of “reconstruction vs. betterment”, or of “speed vs. deliberation” as central.

A closer look at “betterment” locates acts of spatial design and planning within larger processes of valuing and their messy, contested and interest-driven realities. It appears, to say the least, as curious that a larger and more fundamental discussion on how resilience might actually look like and work has largely been suppressed by rhetorics that create a “Do or Die” situation that suppresses most critical discourse – very much resembling the deployment of Baumann’s liquid fear.

The Dark Side

Sustainability and resilience are – at least commonly – considered “good”, much like “beauty” and “utility”. However, utility and beauty both have their dark side, and so do sustainability and resilience. Sustainability’s conceptual ancestry was “carrying capacity”, resilience’s parent was “vulnerability”. Both at some point not too long ago were considered politically incorrect, and replaced with the seemingly benign “s” and “r” words. “Vulnerability” was out because it “disempowered communities and presented them as victims”, and “carrying capacity” suggested that there was a measurable limit to

growth, any and all growth – a conceptual and pragmatic reality that was – and is – unthinkable and anathema, at least within current prevalent economic systems.

Aside from these fundamental problems, there is the additional issue that not all people will be affected equally by the improvements of sustainability and resilience – despite both agenda’s assertion that they are pursuing social and environmental justice – some win, some loose.

Resilience, Techno-Managerial Rhetoric and Liquid Fear

While to “enhance understanding of and response to natural, environmental, social, economic and technological shocks as well as gradual changes” (Urban Europe Joint Programming Initiative) sounds perfectly reasonable and innocuous, the insidious work of urban resilience lies in the obvious and, to its proponents, entirely logical policy suggestion the word carries: “urban dwellers of the world, brace yourselves for austerity [or environmental catastrophe] and everything will be fine in the end!”¹³

“More broadly, however, the resilience movement is a global attempt to address two of the longest-standing and most vital questions facing theorists, planners and leaders. Namely, what is the purpose of society, and what is a society’s responsibility to its citizens.”¹⁴

On a global scale, the UN Habitat III Conference’s New Urban Agenda hailed a “paradigm shift” for pursuing the Sustainable Development Goals (SDGs). However, the new call for “safe, resilient, sustainable and inclusive cities” remains path-dependent on old methodological tools (e.g. indicators), techno-managerial solutions (e.g. smart cities), and institutional frameworks of an ecological modernization paradigm that did not work. Maria Kaika used an intriguing analogy:

“Pursuing a new urban paradigm within this old framework can only act as immunology: it vaccinates citizens and environments so that they can take larger doses of inequality and degradation in the future; it mediates the effects of global socio environmental inequality, but does little towards alleviating it.”¹⁵

Resilience so easily supports not only austerity, but the territorial stigmatisation that so often precedes strategies of dislocation (“that community is just not resilient enough, so we need to break it up and scatter its residents”). Kaika suggests that “despite a conceptual shift in what cities are (...), when it comes to the how of make cities ‘safe, resilient, sustainable and inclusive’ appear already to have been hijacked by the same research agendas and the same policy and methodological frameworks of the past. (...) What if, alongside changing the conceptual framework within which we understand cities, we also changed our research questions, our methodological tools and our institutional frameworks? But in order to change tools, methods and questions, we need to change interlocutors. We need to focus on who has been silenced in the design and delivery of past sustainable development agendas and goals, and why.”¹⁶

Stop Calling Me Resilient

In 2014 posters with the inscription “Stop calling me resilient” appeared all over New Orleans. These were the visible aspect of the public campaign Tracie Washington of the Louisiana Justice Institute launched and disseminated across New Orleans.

Objecting to the way the media and policymakers continuously praised her community for its resilience after hurricane Katrina and the BP oil spill, Washington explained: “every time you say, “Oh, they’re resilient, [it actually] means you can do something else, [something] new to [my community]. ... We were not born to be resilient; we are conditioned to be resilient. I don’t want to be resilient [I want to] fix the things that [create the need for us to] be resilient [in the first place]” [emphasis added].¹⁷



Figure 1. “Stop calling me resilient” signs appearing in New Orleans in 2014. Signs were created by local letterpress printer John Fitzgerald

She clearly objected to the cynical focus of the resilience rhetoric that is so deeply ingrained in the current practices of the spatial design and planning disciplines and professions and its focus on how to make citizens more resilient: “no matter what stresses they encounter”, as this would only mean that they can take more suffering, deprivation or environmental degradation in the future. If we took this statement seriously, we would need to focus instead on identifying the actors and processes that produce the need to build resilience in the first place. And we would try to change these factors instead.”¹⁸

Instead of changing these factors, the focus is on changing the people that are vulnerable, on building buildings and infrastructure that can resist or recover from catastrophic or near-catastrophic events - on “techno-managerial solutions”¹⁹ to deliver socio-environmental justice. In other words, in the discourses on resilience and sustainability the self-determination and empowerment of communities needs to become a critical element. However, the playing field is uneven, as New Orleans and Katrina so glaringly exposed: the hegemonial power of state and non-state actors, their ability to decide on the future of established communities and neighborhoods, to require them to prove their viability (as the post-Katrina recovery planning processes required) and their ultimate ability to decide who gets to continue to live in their neighborhood and who does not puts a very different lens on the regularly fetishized consensus-building so central to resilience and sustainability planning. Tracie Washington’s frustrations are just the tip of the iceberg – many of the residents of New Orleans compared the recovery planning processes to the discriminatory practice of redlining.²⁰ The attempts to be create inclusivity and “get everybody on board” are fraught with suppression and can in fact be seen as working in the traditions of colonialism: residents in New Orleans that participated in the public planning processes “realized that this only legitimized the injustice of existing practices and reproduced fixed roles and power positions. When invited to be “included”, there was already a clear role assigned to them: not that of the equal co-decision maker in setting development goals and allocating resources, but that of the subordinate subject, who is only allowed to choose from a set menu of monetary or other compensatory practices in return for the destruction of her/his livelihood and environment.”²¹

It becomes clear that ambitious political agendas touting “resilience” rhetoric are really about the resilience of the system itself – cities as a spatialized means for the survival of late neoliberal capitalism – and the people that “make” a city are relegated to being willing or unwilling participants. Whether the insidious hazard mapping exercises, or the spectacular (in Guy Debord’s sense)²² renderings of future

city icons (cue Hudson Yards in New York, the (thankfully abandoned) Garden Bridge in London) – all of those are tools to first and foremost manufacture an apparent consensus about the future at all cost:

COUNTERING LIQUID FEAR

Any practice that has an interest in cities as places for dwelling would need to depart shift its focus from the manufacturing of consent to the mapping and engagement of dissent. Following Mitchell's postulate "to be effective, politics must be made visible in public space"²³ will need to engage in "exposing, proposing, and politicizing"²⁴ processes and actors, and make these steps a critical and central component of the design (or other constructions) of space that are democratic and public in the very sense of these words.²⁵

Consequentially, the need to build – or, since this process tends to give different weight to different actors, to manufacture -consensus about intentional place change will have to be interrogated and replaced with approaches that foreground conflict and contestation, based in in approaches and concepts such as Chantal Mouffe's and Ernesto Laclau's "agonism."²⁶

How such approaches might be enacted and by whom is an ongoing discourse – the author's own research has explored the "right to place" and "right to narrative", counter-mapping and counter-stories, and a wide range of spatial tactics. This paper will focus on spatial tactics as one example for countering liquid fear and enacting agonistic politics. A more thorough exploration, and a framework on how politics might be enacted in space and place can be found in the author's "Enacting Landscape Democracy: Assembling Public Open Space and Asserting the Right to the City,"²⁷ in "Mediating Consensus and Enacting Dissensus: Contested Space, Architecture and the Limits of Representation"²⁸ and "Situating Landscape Citizenships: Borders, Margins, Hybridity, and the Uncanny."²⁹

Spatial Tactics and the Re-Making of Public Space

A prominent example of enacting, materializing and spatializing such approaches, are the spatial tactics and counter-stories enacted and told in New Orleans – told by those living in this place, rather than being told about them:

One of them is the long tradition of subaltern and transgressive uses of public space by African-Americans in the City of New Orleans. "Since the beginning of the city's history, poor and working class black New Orleanians have been forced to live on ecologically and economically marginal lands,"³⁰ living in an internal diaspora, and have a long history of practices that create what DeCerteau labels "spatial tactics"³¹

"... for as long as black New Orleanians have been marginalized, they have also created their own organizations that formed a subaltern mainstream. For hundreds of years, African-American communities have organized themselves into social clubs in the New Orleans second line tradition, participating in a long-standing socio-political tradition of self-help, mutual aid, and resistance to structures of oppression"³²

One of the most visible expressions are the performances know to locals as "second-line" parades. They can be best described as moving street festivals, sneaking through New Orleans' poorest neighborhoods, and frequently involve anywhere from 3000 to 5000 people. They are organized and paid for by the social and pleasure clubs, the descendants of the 19th century benevolent and mutual aid societies which provided health, unemployment and burial insurance for their members. These parades truly transform urban space, "creating an alternative social order that private clubs actualize by 'taking to the streets' ordinarily dominated by the quotidian order of inner-city poverty and spatial apartheid."³³ This "tradition of parading lays claim to public streets for pleasure, articulations of community, modes of remembrance, and protest. In parading, residents craft a public sphere for cultural, social, and political expression and fashion the streets into a distinctive, relatively egalitarian public square that exists

regardless of and sometimes in opposition to the government and its formal, institutionally political spheres of action.”³⁴ A key element and spatialization of this expanded and alternate public sphere is the occupation of the wide median strips typical of many streets in New Orleans during and outside of second line parades by local residents, locally referred to as “neutral grounds,” challenging any claim to ownership and control by the (white) hegemonial elites. Second lines and neutral grounds locate a complex of rituals and practices, a spatial rhetoric, that imbues space with meaning. This place, both physically and positionally, becomes one where the minority, exilic and marginal³⁵ can speak with power, and stake counter-claims to assert its own identity and landscape. It is precisely in this and there that bell hooks’ notion of the margin as a site of resistance³⁶ gains some of its power and agency.

THE ANTIDOTE OF AGONISM

Agonism provides a way to think about democracy “that is different from the traditional liberal conception of democracy as a negotiation among interests (...) that the aim of the democratic society is the creation of a consensus (...). However, while we desire an end to conflict, if we want people to be free we must always allow for the possibility that conflict may appear and to provide an arena where differences can be confronted. The democratic process should supply that arena.”³⁷

Agonism is not simply the undifferentiated celebration of antagonism, but implies a deep respect and concern for the other and their positions. Agonism, and agonistic pluralism endeavor “to affirm the perpetuity of the contest”. Their goal “is not to celebrate a world without points of stabilisation; it is to affirm the reality of perpetual contest, even within an ordered setting, and to identify the affirmative dimension of contestation.”³⁸ Agonistic pluralism substantively and procedurally challenges consensual conceptions of democracy – and of concepts laden with liquid fear and rhetoricized in buzzwords like sustainability and resilience. Honig argues that every political settlement engenders remainders to which it cannot fully do justice. Agonistic pluralism brings out the emancipatory potential of political contestation and of the disruption of settled practices. Conversely, she recognizes that politics also involves the imposition of order and stability.

Politics then can neither be reduced to consensus, nor to pure contestation, but both are essential dimensions of politics – and of public spaces and their design. Such a conceptualization of the public sphere – and the spaces where it takes place – would act as a potent antidote to liquid modernity and liquid fear.

CONCLUSION

Spatial design and planning professions, unless they are an exercise of unmitigated autocratic power, have relied on the manufacturing of consensus as both foundation and goal, in particular if the project has a public dimension or is involving the creation or change of public space. There are many problematic assumptions here – the aforementioned issue that the needs and wants of many constituencies and communities cannot be accommodated and that benefits and burdens will invariably be unevenly distributed, resulting in outcomes of spatial and environmental injustice. Even more problematic is the (generally unacknowledged) assumption that space and the ways it is used are stable over periods of time, and the resultant desire for an absence of any significant and effective contestation. Liquid fear – in all its disguises, including sustainability and resilience – has been an effective tool to achieve this.

Good design and planning should serve the public good – and not particular interests. Against the backdrop of climate change, increasing uneven development and standards of living, environmental and public health, social and environmental injustice design needs to be first and foremost about the resilience of democracy, about the ability of those affected to participate in the decisions about the future of the places they are living on. It cannot be about the resilience of a system that is based on

maintaining and even increasing inequality. Which and how big of a role spatial design and planning fields can – and want to - play in this remains to be seen – it is clear though that their apolitical stance and allegedly value-free expertism that is so pervasive should not be maintained any longer – and not be disguised by resilience rhetoric and fancy renderings of cool projects. Liquid fear and liquid modernity can only be counteracted by an informed, inclusive public debate that engages difference and dissent – however hard and uncomfortable that might be. It is incumbent on the spatial design and planning fields to thoughtfully and critically participate in these processes and not just uncritically serve a system they benefit from and depend on – by attempting to fix liquid modernity in place.

NOTES

¹ Zygmunt Bauman, *Cultural Identities and the Politics of Anti- Racism*, ed. Prina Werbner and Tariq Modood, (London: Zed Books, 1997), 50-51.

² See Zygmunt Bauman, *Liquid Modernity*. (Cambridge, MA: Polity Press, 2000).

³ For a detailed analysis of the relationships between space, place, belonging and identity see Joern Langhorst, "Situating Landscape Citizenships: Borders, Margins, Hybridity, and the Uncanny." In *Landscape Citizenships* ed. Tim Waterman, Jane Wolff, and Ed Wall, E. (Abingdon: Routledge, 2021), 109-129.

⁴ Manuel Castells, *The Informational City: Information, Technology, Economic Restructuring and the Urban Regional Process*, (Oxford: Blackwell, 1989), 349

⁵ Manuel Castells, *The Power of Identity*. (Oxford: Blackwell, 1997). He adds that localizing state discourses and strategies, under conditions of advanced globalization, have intensified the disjuncture between global elites and local activists.

⁶ Zygmunt Bauman, "City of Fears, City of Hopes", *Critical Urban Studies: Occasional Papers*, (2003), 14

⁷ Langhorst, *Situating Landscape Citizenships*, 116.

⁸ Langhorst, *Situating Landscape Citizenships*, 116-7

⁹ Zygmunt Bauman, *Liquid Fear*. (Cambridge, MA: Polity Press, 2006), 3.

¹⁰ Bruno Latour, *Reassembling the social: an introduction to actor network theory*. (Oxford: Clarendon, 2005).

¹¹ Chantal Mouffe, "Deliberative Democracy or Agonistic Pluralism," *Political Science series*, 72, (2000). Institute for Advanced Studies, Vienna.

¹² Robert B. Olshansky Lauri A. Johnson, *Clear as Mud: Planning for the Rebuilding of New Orleans*. (Chicago: APA Press, 2010).

¹³ Tom Slater, The resilience of neoliberal urbanism. Retrieved February 2, 2014 from: <http://www.opendemocracy.net/opensecurity/tom-slater/resilience-ofneoliberal-urbanism>.

¹⁴ Oliver Wainwright 2014).

¹⁵ Maria Kaika, "Don't call me Resilient Again! The New Urban Agenda as Immunology ... or what happens when communities refuse to be vaccinated with 'smart cities' and indicators." *Environment & Urbanization Vol 29* (1) (2017): 89.

¹⁶ Maria Kaika "Don't call me Resilient Again": 94.

¹⁷ Tracie Washington, cited in "Don't call me Resilient Again": 95.

¹⁸ Maria Kaika "Don't call me Resilient Again": 95.

¹⁹ Maria Kaika "Don't call me Resilient Again": 95.

²⁰ "Green-dotting" was a term coined to describe the green dots that marked neighbourhoods to be turned into parks, wetlands and greenspace in the Bring New Orleans Back plan.

²¹ Irina Velicu and Maria Kaika, "Undoing Environmental Justice: Re-Imagining Equality in the Rosia Montana Anti-Mining Movement", *Geoforum*, (2015): n.p. DOI: 10.1016/j.geoforum.2015.10.012, cited in Maria Kaika, "Don't call me Resilient Again": 96).

²² Guy Debord, *Society of the Spectacle*. (New York: Zone Books, (1994) [1967]).

²³ Donald Mitchell, *The right to the city: Social justice and the fight for public space* (New York: Guilford Press, 2003), 211.

²⁴ Peter Marcuse, "From critical urbanism to right to the city." *City 13* (2009): 185–197.

²⁵ For a more detailed description of a framework to achieve this see Joern Langhorst, "Enacting Landscape Democracy: Assembling Public Open Space and Asserting the Right to the City," in *Defining Landscape Democracy*, ed. Shelley Egoz, Tim Richardson, Deni Ruggeri and Karsten Jørgensen (Cheltenham: Edward Elgar, 2018), 106-118.

²⁶ See Chantal Mouffe, "Deliberative Democracy or Agonistic Pluralism," *Political Science series*, 72, (2003). Institute for Advanced Studies, Vienna and Chantal Mouffe, *Dimensions of Radical Democracy: Pluralism, Citizenship, Community*. Verso: London, and Ernesto Laclau, *Emancipation(s)* (London: Verso, 1996).

²⁷ In Shelley Egoz, Tim Richardson, Deni Ruggeri and Karsten Jørgensen, eds. *Defining Landscape Democracy*, Cheltenham: Edward Elgar, 2018, 106-118.

²⁸ In Graham Cairns, (ed.), *Architecture, Media and Populism*. (Abingdon, UK: Routledge, 2022), 91-116.

²⁹ In Tim Waterman, Jane Wolff, and Ed Wall, (eds.), *Landscape Citizenships*, (Abingdon, UK: Routledge, 2021), 109-129.

³⁰ Rachel Breunlin and Helen Regis, "Putting the Lower 9th Ward on the Map. Race, Place and Transformation in Desire, New Orleans," *American Anthropologist*, 108,4, (2006), 746.

- ³¹ See Michel DeCerteau, *The practice of everyday life* (Berkeley: University of California, 1984).
- ³² DeCerteau, *The practice of everyday life*.
- ³³ Helen Regis, "Second Lines, Minstrelsy, and the Contested Landscapes of New Orleans Afro-Creole Festivals." *Cultural Anthropology* 14(4) (1999): 472
- ³⁴ Peter G. Stillman and Adelaide H Villmoare "Democracy Despite Government: African American Parading and Democratic Theory." *New Political Science*, 32(4), (2010): 485.
- ³⁵ Homi K. Bhabha, "DissemiNation: Time, Narrative, and the Margins of the Modern," in Homi K. Bhabha, ed. *Nation and Narration* (London: Routledge, 1990): 300
- ³⁶ bell hooks, "Choosing the Margin as a Space of Radical Openness". *Framework: The Journal of Cinema and Media*, 36, (1989): 15- 23.
- ³⁷ Chantal Mouffe and Ernesto Laclau in *Hearts, Minds and Radical Democracy: Interview with Ernesto Laclau and Chantal Mouffe* by Dave Castle, 1998. <https://www.redpepper.org.uk/hearts-minds-and-radical-democracy/> accessed May 31, 2020.
- ³⁸ Bonnie Honig, *Political Theory and the Displacement of Politics*. (Ithaca: Cornell University Press, 1993): 15.

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HOUSING AND NEIGHBORHOOD PREFERENCES IN CLUSTER REDEVELOPMENT: A CASE OF RASTA PETH, PUNE

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INTRODUCTION

Most Indian cities ail with the questions of development and re-development, its nature, suggestive policies, current practices and consequences. Development being an ever-evolving process, transformation in the style and character of the cities can be observed through centuries; with cities in the midst of restricting process.¹ On one hand where cities experience spatial expansion, on the other also witness transformation in the spatial organization. It is the historic cores of Indian cities that face maximum pressure with impact of these redevelopment patterns witnessed through a drastic change in their character, morphology, setting and clear transformation into newly configured spaces. These redevelopments can be understood as a product of economic restructuring in the city, resulting in dominant centers and new forms of housing² with spaces becoming objects of commodification.

Urban renewal schemes by the state/ governing bodies in most of the countries are seen as a possible solution to improve the conditions of the historic cores. Urban renewal is a recent term in the Indian context and thus offers opportunities to explore the theoretical domain, balancing economy dynamics and planning for contextually relevant neighborhoods;³ but is also disconnected from the interests of residents living on the land.⁴

This research thus investigates the aspect of co-relationship between the users and their housing preferences in case of such urban renewals/ cluster redevelopment and situates itself with the given background of recent introduction of Cluster Redevelopment in the State of Maharashtra (2020). The study aims to assess and identify unit, building and neighborhood preferences of the occupants within the selected cluster that can guide planning and design in case of the cluster redevelopment's implementation.

REDEVELOPMENT IN THE INDIAN CONTEXT

Indian cities at present are in phase of transition and transformation with many facing spatial development and reorganization. On one hand, the cities are developing new suburban areas with relatively better-built infrastructure and services; while on the other hand, the once primary and bustling central areas are succumbing to awful degeneration.⁵ Redevelopment has become quite popular since it is a most practical way, considering the condition of building stock, land politics, FSI-TDR dynamics and ratio of investment vs. rising land prices.⁶

Government programs in India are increasingly advocating policies of urban renewal and redevelopment for improvement of the built environment, upgradation of infrastructure in the core or oldest part of cities, and for optimum utilization of available urban land through densification in already serviced inner city areas.⁷ Over the last 2 decades, the Urban Redevelopment policy has continued to evolve to reduce loopholes and optimize city development potential.⁸ Redevelopment in cities thus has been seen as a tool for land supply and the rationalization of regulatory mechanisms within the complex interplay of the social, economic and cultural.⁹

The Unified Development Control and Promotional Regulations (UDCPR) published by Maharashtra state in 2020, recognizes the need for urban redevelopment in the historic core areas. The stipulated regulations for cluster development under Urban Renewal Scheme (URS) considers age of buildings, focuses on eligibility criteria, rehabilitation of tenants, FSI rules etc. The state through URS thus aims to regulate density within areas, redevelop the old built stock, regulate nature of urban landscape through provision of amenities, open spaces, effective transportation networks adopting linear and hierarchical process of redevelopment.

CLUSTER REDEVELOPMENT IN THE HISTORIC CORE AREAS

Cluster based approaches are micro economically based, emphasizing national, state, and local competitiveness in a global economy.¹⁰ Of the state led programs for urban restructuring, cluster redevelopment in the Indian context is a recent concept. It has been envisioned as a solution to renew the old building stock within various parts of cities and use the area to suffice the housing needs in the areas with higher land values. It has transformed the old housing stock with higher densities in Mumbai and has shaped the urban landscape with far more complex and intertwining forces of living, working, socializing, recreating and cultural practices.¹¹ Bindi Bazaar (a mixed used precinct within the inner city of Mumbai) is the only neighborhood redevelopment under the Cluster Redevelopment Policy. Initiated in 2011, this cluster redevelopment focuses on more than 65000 sq.m area under the cluster redevelopment scheme.¹²

Being a lesser explored domain, the cluster redevelopment within historic areas of the Indian cities offers opportunities to explore narratives of land use, economic viability and ingrained social and cultural circuits. The scheme if addressed considering notions of space, culture and resident preferences can propose a new model to address issues of dilapidating-built stock in the historic cores.

NEED FOR HOUSING PREFERENCES

Housing is a symbol of life spent, experiences and formed associations and is connotation of deep structures of social systems. It is reflected through the domestic spaces dedicated to the importance of relating housing design to the demands of motivational factors.¹³ In addition to the intangible parameters; the family size, structure, per capita income and aspirations also affect the housing decisions.¹⁴ The trends in housing research also indicate increased interest in the study of perception of the housing occupants about the housing environment and its impact on the wellbeing;¹⁵ classified under “Housing Adequacy”. Though several connotations can be found in literature, UN (in the OHCHR report: 2009) specifies: i) Security of tenure, ii) Habitability, iii) Availability of services, iv) Affordability, v) Accessibility, vi) Location, vii) Cultural adequacy; as a part of a right to adequate standard of living.

Housing preferences thus present a complex and sometimes inconsistent set of factors that are related to tenure, price, size etc., its place and how it provides access to amenities and also how it facilitates social interaction.¹⁶ (Jiang & Chen 2015),¹⁷ emphasize about the impact of dwelling unit attributes like location, size, orientation, purchase price that impact the decisions and choices. Review of literature

indicates relevance and impact of objective and subjective characteristics on choice and preference of housing.

NEED FOR NEIGHBORHOOD PREFERENCES

A city or settlement serves as a museum containing the historic and cultural accumulations of different periods, reflecting the meaning and characteristics of human life. Lefebvre advocates the conservation of “the diversity of ways of living, urban types, patterns, cultural models, and values associated with modalities and modulations of everyday life” that have taken place over time.¹⁸ (Fattah et. al.),¹⁹ mention about cultural expressions, neighborhood characteristics, living environment and meaningful spaces dictating the user’s housing preferences and choices. It is attention to these personal factors that is central in achieving person – environment congruence (PEC) to create a suitable living environment in housing.²⁰

The research on housing and neighborhood preferences suggests people’s preferences being based on subjective and objective attributes. Following attributes at housing and neighborhood level are identified from the literature:

	Attributes	Authors
Unit Level	Size of the unit	(Ibem & Alagbe, 2015), (Booi & Boterman, 2020), (Jiang & Chen, 2016), (Ibem & Amole, 2011)
	Characteristics of Rooms	
	Location of unit	
	Floor Number	
	Purchase Price	
	Orientation	
	Location of openings	
	Amenities	
	Levels of privacy	
Building Level	Orientation of building	(Lasisi, 2006), (Reilly, 2008)
	Quality of structure	
	Access to basic amenities	
	Surrounding infrastructure	
	Proximity to community services	
Neighborhood Level	Socio-cultural context	(Zavie & Jusan, 2012), (Lefebvre H., 2003), (Rapoport, 2000) , (Bachelord, 1994), (Jusan, 2010),(Fattah et al., 2021)
	Urban patterns	
	Cultural models	
	Community spaces	
	Characteristics of neighborhood	
	Access to open spaces	
	Mobility patterns	
Greenery		

Table 1. Attributes of Housing and Neighborhood Preferences

METHODOLOGY

The study adopts a deductive approach to identify the housing and neighborhood preferences in cluster redevelopment. The attributes of housing and neighborhood preferences are identified through literature from the domain of housing preferences, housing adequacy, neighborhood preferences, place attachment and residential redevelopment etc. A questionnaire tool developed includes 28 attributes related to unit level, building level, neighborhood level preferences and preferences related socio-cultural places in the neighborhood and the data being gathered on five-point psychometric scale. Rasta Peth in historic core city of Pune, Maharashtra State in India was selected as study area to identify the housing and neighborhood preferences in cluster redevelopment. The administered survey used a questionnaire tool by one of the authors and 71 participants responded to the questionnaire. The questionnaire included questions pertaining to objective and subjective preferences related to housing and neighborhood. The data was coded and analyzed using SPSS. A factor analysis was used to develop comprehensive factors explaining the preferences of existing residents in Rasta Peth. Four constructs developed through factor analysis were labeled and discussed in the light of available literature. The data received for architectural character of the neighborhood was studied with the objective and subjective preferences related to housing and neighborhood to draw conclusions.

CASE OF RASTA PETH

The historic core of Pune is a planned city with 18 quarters known as *Peths* in a local language.²¹ Rasta Peth is one such quarter of the old core developed in 1780, that has mixed-use typology buildings. Rasta Peth is selected as a representative case considering a distinct grid pattern planning (Figure 1) with a mix of historic buildings (Figure 1), old and new building stock (Figure 2), socio-cultural and economic mix (Figures 3-7) and current redevelopment pressures.

The redevelopment is observed at plot level in core areas and does not contribute in creation of public infrastructure that the neighborhood lacks due to small plot sizes (Figure 1 and 3). The provisions of cluster redevelopment under UDPCR guidelines (The State Government of Maharashtra, 2020), allows amalgamation of plots up to minimum 1000sq.m of area to facilitate designing comfortable housing units, provision of parking, lifts and open spaces. Given the nature of neighborhoods, plots and increasing plot level redevelopment, Rasta Peth was seen as a potential case for the study

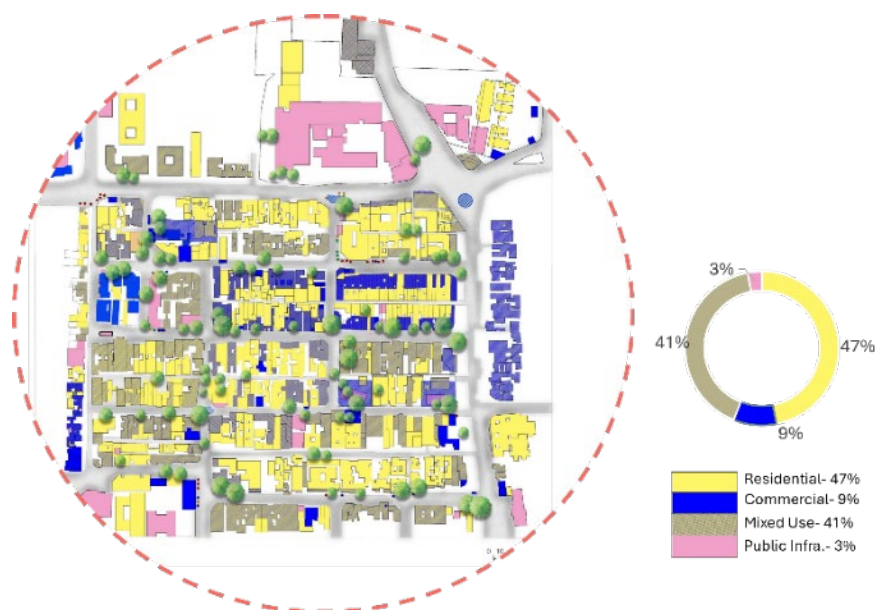


Figure 1. Existing land use plan of Rasta Peth (Source: Fourth year, B. Arch, BNCA).



Figure 2. Existing land use plan of Rasta Peth (Source: Fourth year, B. Arch, BNCA).



Figure 3. Scaled model of Rasta Peth indicating grid-iron pattern, small lot sizes (Source: Fourth year, B. Arch, BNCA).



Figure 4. A mix of low and mid-rise dense development and continuous street façade (Source: Fourth year, B. Arch, BNCA).



Figure 5. Vir Tanaji Trust Temple (Left) and Church of Holy Angels (Right) (Source: Author).



Figure 6. Ayappa Swami Temple (Left) and Lakheri Maruti Temple (Right) (Source: Author).



Figure 7. Street characterized by mixed use development, continuous facade, street vendors, vehicular and pedestrian movement, a strong building and street relationship (Source: Author).



Figure 8. Lack of parking and vehicles parked on both sides of the streets (Source: Author).

DATA COLLECTION AND ANALYSIS

The objectives of the survey of residents were to identify housing and neighborhood preferences in case of cluster redevelopment. The respondents belonged to diverse gender and age groups with sizeable length of tenure. Out of 71 respondents that participated in the survey, 76.1% of the respondents were owners whereas 23.9% were tenants. The average length of their tenure was approximately 14 years. The sample had fair distribution of males and females with 56.3% males and 43.7% females. The mix of age group of respondents involved 23.9% of respondents between 19 and 30 years of age group, 36.6% between 31 and 45 years and 33.8% of them between 46 and 60 years of age group. The data for first objective was collected on a Likert scale type question, whereas the data for second objective was collected by presenting images related to scale of building, typology of building clusters and facade characteristics.

A factor analysis was used to analyze references related to housing and neighborhood amenities. The KMO measure of sampling adequacy was 0.752 that indicated data being adequate for factor analysis;²² (See Table 2). Bartlett’s Test of Sphericity with significance level of 0.00 (See Table 2) indicated presence of correlations among variables.²³

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.752
Bartlett's Test of Sphericity	Approx. Chi-Square	998.176
	df	406
	Sig.	.000

Table 2. KMO and Bartlett’s Test.

(Sammuels),²⁴ suggests ignoring factors with lesser factor loadings by suppressing values of factor loading less than 0.3; whereas, (Burton & Mazerolle),²⁵ recommend retaining the variables with factor loading of 0.50 or higher for factor analysis. Therefore, while carrying out factor analysis the attributes with factor loading less than 0.5 were suppressed. Six attributes including the location and orientation of kitchen, dry balcony, security video intercom system, need for privacy, playgrounds and living with same neighbors were eliminated, considering their factor loadings being lower than 0.5. Thus, the factor analysis indicated that these attributes do not play any significant role in shaping the factors of housing and neighborhood preferences in cluster redevelopment.

Eight factors emerged from factor analysis indicating residents’ preferences. However, (Fava & Velicer);²⁶ as cited in (Beavers et.al),²⁷ suggest that including factors with only one or two variables is not recommended as it may not represent the data structure accurately. Thus, two factors were eliminated from the factor solution and six factors with three and more variables were retained (See Table 3).

Sr No	Housing and neighborhood attributes	Rotated Component Matrix						Labeling of factors	% of Variance
		1	2	3	4	5	6		
1	Walking tracks	.694						Socio-cultural spaces and pedestrian friendly streets	27.64
2	Perseveration of existing trees	.685							
3	Seating arrangement in public areas of the neighborhood	.657							
4	Preservation of architectural character of Rasta peth	.646							
5	Gardens and parks	.598							
6	Building orientation	.548							
7	Tree cover along the street	.528							
8	Good street lighting	.511							
9	Provision and location of lifts		.727					Building level preferences	8.43
10	Size and layout of common entrance		.635						
11	Covered parking spaces		.616						
12	Quality of building exteriors		.570						
13	Quality of sanitary ware			.843				Unit level preferences	6.53
14	Quality and appearance of interior materials			.722					
15	Appearance of building materials			.646					
16	Proximity to Daily needs and grocery shops				.804			Neighborhood amenities	6.1
17	Closeness to schools and other educational facilities				.667				
18	Closeness of medical facilities				.640				
19	Closeness of public transport				.634				
20	Gyms					.697			5.76
21	Malls and multiplexes					.665			
22	Separate dining space						.821		4.64

Table 3. Housing and neighborhood preferences of residents of Rasta Peth.

The first factor consisted of eight variables labelled as ‘Socio-cultural spaces and pedestrian friendly environment’. High response for walking tracks, tree cover and good lighting indicated preference to safe and pedestrian friendly environment. Preference to the preservation of architectural character of Rasta Peth and building orientation indicated resident’s willingness to adhere to the existing architectural character and street and building relationship. The first factor signified the role of pedestrian friendly environment and preservation of socio-cultural places within urban environment. The second factor consisted Building level preferences, indicated through four variables. The present-day building stock analysis reflected 50% buildings being more than 25 years old, with lack of parking and lift facility, with streets flooded with parking, thus impacting the pedestrian movement patterns. (Anagal & Natu);²⁸ (Vaishampayan & Bhaduri),²⁹ have reported that original residents of old residential developments embrace redevelopment for functional obsolescence and lack of modern amenities such as lifts and car parking. However, it is interesting to note that people give more preference to socio-cultural facilities and pedestrian-friendly neighborhood when it comes to cluster redevelopment. The variables constructing the third factor included “Unit Level Preferences”. This endorses Vaishampayan & Bhaduri’s (2022) proposition that residents aspire for house upgradation and modern amenities through redevelopment. The fourth factor consisted of four variables emphasizing “Neighborhood amenities”. The literature (Tabachnick & Fidell),³⁰ suggests that factors with only two or lesser variables can be ignored and need not be retained. Thus, fifth and sixth factors that include only two variables and do not significantly contribute to resident preferences were not retained.

PHOTO ELICITATION AND DATA ANALYSIS

Photo elicitation technique was used to seek the responses from residents of Rasta Peth to understand their architectural preferences in terms of building clustering typology, building height, and the character of facade design. The responses about building height indicate 39.4% residents preferred low rise buildings with continuous facade and 42.3% residents preferred mid-rise buildings (Table 4). The responses by residents of the Rasta Peth highlight low and mid-rise buildings, similar to the existing ones.

<i>Option 1 (Low height building with continuous facade)</i>	<i>Option 2 (Mid-rise building)</i>
	
<i>Option 3 (High rise building)</i>	<i>Responses received</i>
	

Table 4. Photo elicitation 1 (Building height preference) (Source: Author).

The second photo elicitation was carried out to understand the most preferable clustering typology by the residents. Residents were shown images of various clustering typologies as observed in Rasta Peth (Table 5). Although the question received a mixed response; interestingly, perimeter blocks and street housing were the most preferred typology with 22.5% and 21.1% of people selecting those typologies, respectively. This underlined that resident of Rasta Peth had a strong association with the street and preferred maintaining an architectural character similar to existing character and mid-rise buildings with a well-defined building edge along the street.


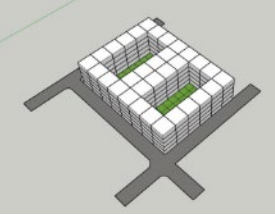



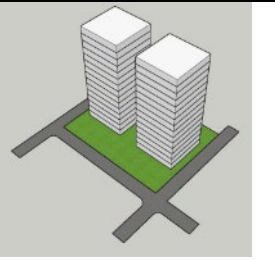
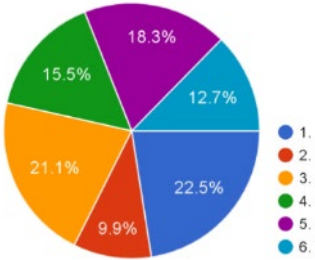
<i>Option 1- Perimeter block</i>	<i>Option 2- Courtyard typology</i>	<i>Option 3- Existing Rasta Peth (Street housing)</i>	<i>Option 4- Mid-rise long blocks</i>
			
<i>Option 5- A group of point blocks</i>	<i>Option 6- Mega point block</i>	<i>Responses</i>	
		 <ul style="list-style-type: none"> ● 1. ● 2. ● 3. ● 4. ● 5. ● 6. 	

Table 5. Photo elicitation 2 (Clustering typology preference).

Question regarding facade design preferences was posed by displaying 3 pictures: traditional housing facade in Pune, a facade of a modern building and a facade having a fusion of old and new (Table 6). Close to half of the residents preferred a fusion of old and new, while 38% of them preferred modern facade and significantly low response for traditional facade. These findings indicated that most of the residents have a tendency of ‘simultaneous adherence to tradition and embracing a change’.




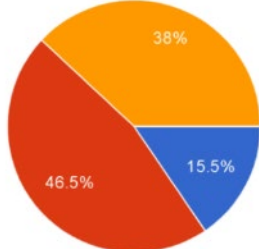
<i>Option 1- Traditional housing facade in Pune</i>	<i>Option 2 – Fusion of old and new</i>
	
<i>Option 3- Facade of modern housing</i>	<i>Responses received</i>
	 <ul style="list-style-type: none"> ● 1. Traditional ● 2. Fusion ● 3. Modern

Table 6. Photo elicitation 2 (Building Facade preference).

CONCLUSIONS

The research attempted to understand the housing and neighborhood preferences of the residents in historic cores considering a case of cluster redevelopment. This research not only investigated the spatial preferences of residents in terms of amenities requirements at unit, building and neighborhood level, but also touched upon their objective and subjective preferences for architectural characteristics post-redevelopment. Through the surveys, it was observed that residents preferred common good over their individual benefits in case of redevelopment at a larger scale. The findings also helped in conformation of preferences evolved through literature review at a neighborhood level for the given case, thereby establishing its relevance even in the Indian scenarios. While this research focused on a historic cluster in Pune's core city, similar studies if conducted across other historic clusters can give insights about user preferences within different contexts.

Such analysis if done prior to the implementation of a cluster redevelopment scheme within a historic neighborhood can aid in preparation of the project brief for policy makers, planners, designers and developers. The analysis of responses related to the architectural characteristics emphasized on mediation of choices between the traditional aspects and acceptance of change. This study thus can help in formulation of context based urban design guidelines for a cluster redevelopment project within historic cores of cities.

NOTES

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THE SPATIAL SECURITY OF WATER: ACCESS IN THE BUILT ENVIRONMENT IS INDISPENSABLE TO SHAPE SOCIAL, ECONOMIC AND ENVIRONMENTAL PROSPERITY

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INTRODUCTION

The complexity of the city structure is the complexity of the discontinuity of spatial movements. The city is the composition of a diverse pattern of street layouts. Urban grid and density represent the diversity of movement patterns through space.¹ The continuous flow of spatial movement is the natural order to add value to the space. The city as a whole is one solidarity system embedded with diverse urban movement patterns.² The transformation of space without understanding the natural function and movement economy nerves the urban core with a destructive eccentricity of urban growth.³ The urban grid is a powerful embedded system in the city structure for building spatial relationships with other fundamental structures like water and green structures, where urban forms and functions are mainly grounded in this embedded⁴ system. If there is a discontinuity of space, then social problems are disorderly and accumulate spatial complexity of segregation cut across the city structure. Fragmented growth of the urban grid adversely accelerates movement order without integrity of space to the urban core. It rapidly destroys peri-urban natural settings and water bodies through the process of unplanned industrialization and sprawl⁵ of urban expansion. The configuration of space in the city through spatial movement analysis is a long-term sustainability of social, economic, and environmental topographies. To illustrate those complex scenarios, the street structure of contemporary Dhaka is pragmatically evaluated in this research. This research findings reveal its character with the intervention of water and urban networks. Here, urban systems are discussed under the parameters of contemporary duality urban grids. Where it “(...) follows, as pervasive as the first: the more the system is run from the global to the local, then the more the reversed logic prevails over the local-to-global logic.”⁶ They are foreground and background networks, where urban centrality is investigated through the embedded system of street structures, considering the spatial position of water structures.

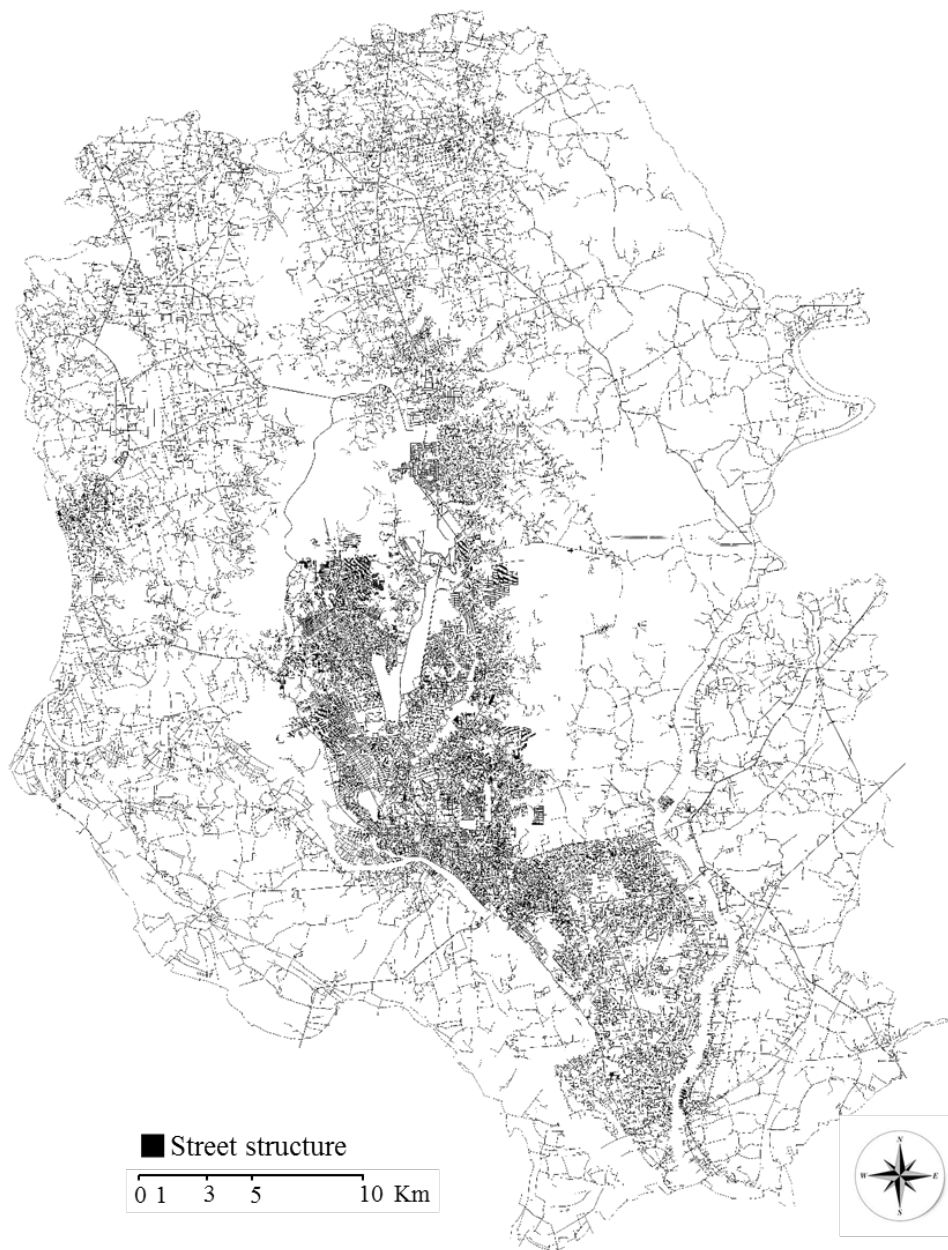


Figure 1. Spatial morphology of movements in the fast-growing metropolis area of DHK.

The spatial dynamics of contemporary Dhaka city consist of urban (formal, informal, slum, and indigenous) and territorial street layouts. The whole structure of the city demonstrates the spatial behavior of the density and morphological growth in this water-based topographical ground (Figure 1). The space network's density and diversity are coherent with social and topographical variations. Dhaka is growing due to its diversity of spatial movements. The density progression in this metropolis area is developed as a boundary of spatial segregation with the complexity of topographical differences. Figure 1 demonstrates the growth of the street structure's spatial density in Dhaka's metropolis area. The illustrated map depicts the degree of spatial density and separation of urban and territorial space configurations. Topologically, the dense central part of the city demonstrates the metropolitan (jurisdiction) area and the core position of the whole metropolis region. This metropolitan area generally combines formal and informal layouts of street structures. Here, the density of street structures

marginally declined in the north and south of the city through the sprawl of informal street structures. The city's metropolitan area is linearly shaped and north-south orientated with its dense circulation of the urban grid. Besides, the low territorial density of street structures and neighbor centers in the western part of the city significantly increases the linear growth of parallel development by means of antagonism to the central part of the city. The territorial neighbor street structure is evidently separated by the densely built urban zone's surrounding water bodies (rivers). A similar scenario is also visible in the north and south parts of the city, where the street structures are rapidly densifying urban forms due to the competition of the evolving urban core. The western part of the street structure seems to be transforming from territorial to informal development growth, and the north-south part is transforming from informal to a large-scale concrete floor. The scenario is slightly different in the east of the territory, where street structure is poorly developed due to the lowland area. The sprawl of new growing satellite towns fills this area. The impact of a hydrological ring of the topography accelerates or decelerates the density of movements in the different parts of the city differently. Here, water is treated as an obstacle to the city's growth homogeneously around the city center.

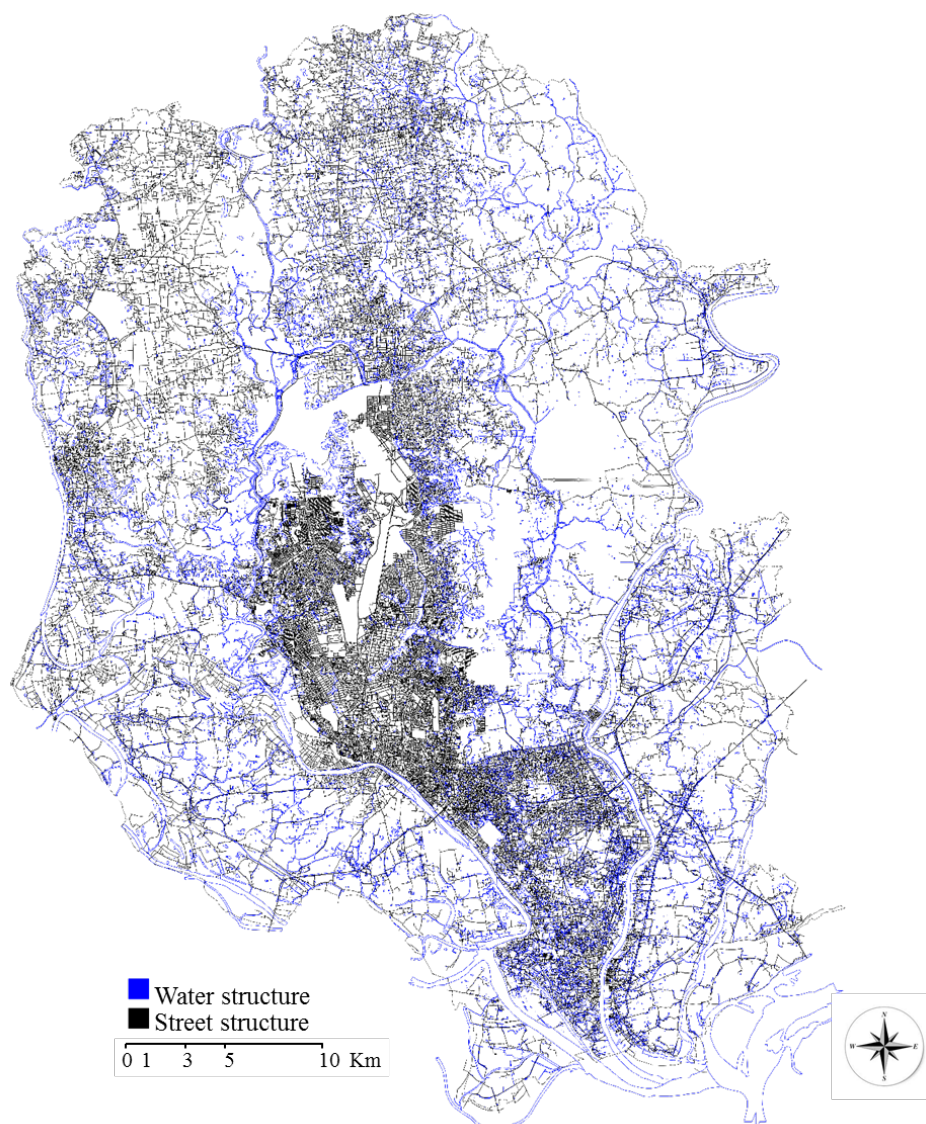


Figure 2. Water and street network of Dhaka city.

Therefore, the topographical position of the water was one of the reasons for shaping the city's north-south orientation through the dense and complex growth of the urban movement. The dense part of the deltaic city (metropolitan area) is significantly observable by the crisscross shape of surrounding rivers. Due to the availability of the water network, Dhaka was geographically connected to both the global and local regions. Surrounding rivers generate many network canals in this deltaic landscape by keeping the natural biodiversity resources through those liquid systems. Figure 2 shows the topographical diversity of water and street structure of the metropolis area of the capital city, Dhaka. The lack of water development in urbanization transforms the ground separately without any dynamic connectivity between urban and territorial space. Discontinuity of space separated the territorial and densified urban settlement, which is now a contemporary threat to the spatial development of movement and network of water structures inside those dual landscapes. Deficiency of urban planning and urbanization: the city has failed to correlate water and street networks. As a result, street networks of local centers are entirely disintegrated from the city's urban core. Although the diversity of water typology is printed on this ground, the natural water landscape is ignored in urban engineering. However, the metropolitan city is now structurally fragmented near the water bodies and separated from the territorial structures. Besides the inadequacy of spatial connectivity to the urban core, parallel spatial centers are emerging in the territorial landscape. Those regional centers are concentrating movements improperly and tend to blend with the urban grid without any spatial identity of local towns and centers. For example, the western part of territorial street structures is also concentrated in parallel ways, and the southern part almost blends into the city grid's core area. Those surrounding unplanned territorial growth of street structures accelerate the city grid's density. It is a man-made, slow-moving catastrophe affecting the whole urban and environmental core system. As a result, territorial regional towns are rapidly transforming through unplanned street structures of informal patterns. In that case, the territorial development of the water network and local connectivity to the city center are spatially meaningful for the future growth of this contemporary metropolis.

Spatial order

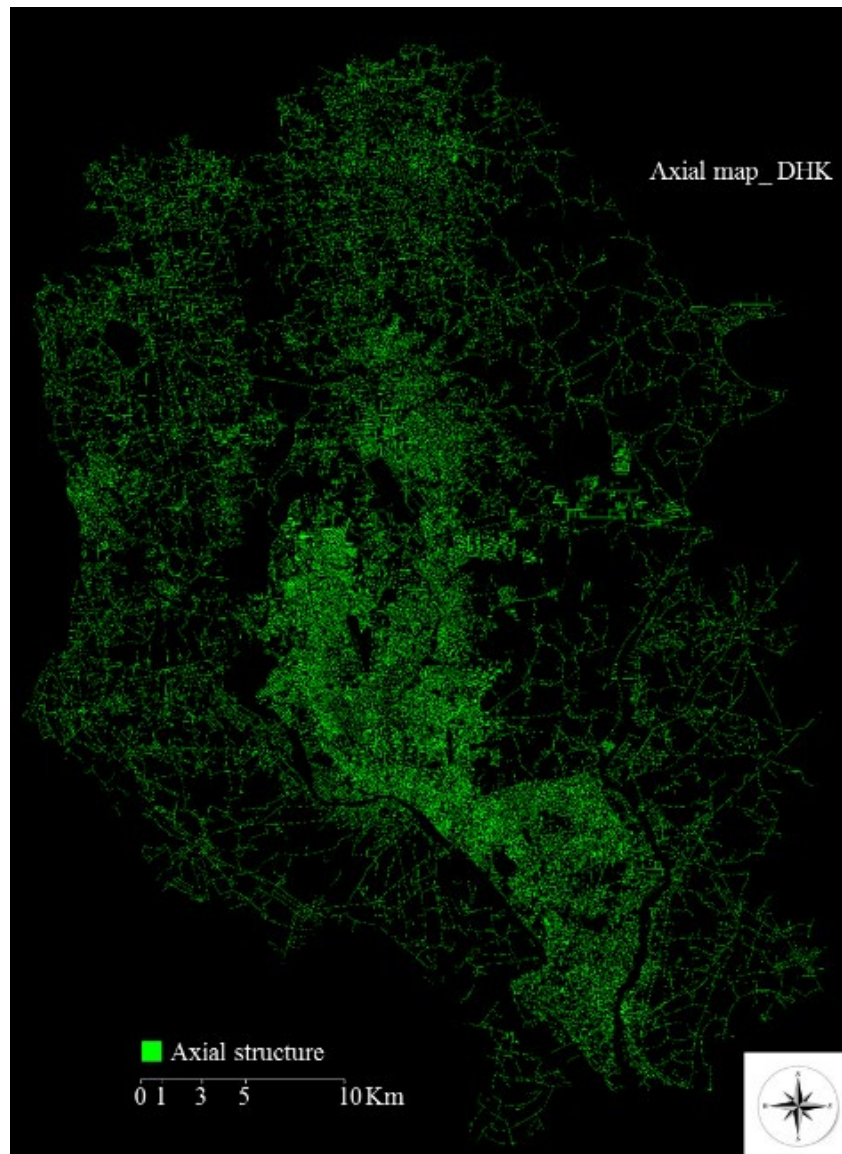


Figure 3. Conceptual representation of space network of Dhaka metropolis area.

The axial map of Dhaka city is drawn with the emerging satellite towns, centers, and territorial structures. It also represents the axial growth in the metropolis boundary and is used as a spatial syntax analysis-based map.

Foreground network

Urban sustainability of space is enrooted in the duality of urban networks by optimizing the potential movement of the spatial dimension of functional differentiation. The foreground network is shaped by the economic activity factor, while the formation of social and cultural factors shapes the background network. It means that the evolution of the dual form of the urban system in the city emerges from the functional interaction of economic and social factors.⁷ Subsequently, those generic forms of urban networks are the progression of human interaction in the space. Spatial sustainability could be better comprehended from the three sustainability domains.⁸ They are the environmental, economic, and sociocultural forces already embedded in different complicated scenarios in the city structure.⁹ As the

spatial value of the economic center is the generic process of the foreground network, it is the degree of the spatial properties that distinguishes the non-centric part of the grid. The comparison of spatial networks between the active lines of continuation in the foreground network correlates to the spatial economic center. This dimension is suggested by the locally densified grid that emerges from the self-organization process in Dhaka city's case. The order of global and local values evidences the city structure's foundation. Those echoes of spatial differences also impact the socio-economic differences in the demographic layout. Economic factors and space interact with the natural relationship between 'movement to' and around the centers where the spatial pattern of movement's intensity is intuitive in the urban grid.¹⁰ The geometric configuration of space and syntactically revealing movement patterns are a way to investigate spatial factors where the centers are deeply rooted in the foreground network. It is the economic potential of the city structure to act with other space factors for framing the scenario of spatial economic sustainability. However, critical spatial relations are the spatial behavior of the internal structure of the space and center from its local and global perspective.

Background network

The background network is mainly the residential space with comparatively low potential movements, whereas high potential movement values are on the foreground network. Syntactically reducing the radius of the integration value of high property shows that they are relatively globally integrated and locally segregated.¹¹ That measurement of the embedded system is the spatial control of the judgment to determine the spatial segregation in the system of dual networks. It also depicts how the residential space is integrated into the depth of space with other functional factors. The effect of choice becomes a spatial control of movement patterns in an integrated system experienced from the point of spatial segregation. The critical variables of the residential space background network conceptually intervene in the social community formation variable. In fact, "if space can in some sense support community formation, then it can play not only a positive role in creating social sustainability, but also a direct consequence for play a role in the reduction of anti-social activities as well."¹² Typically, smaller groups of axial patterns are more likely to form a cluster of communities than larger ones because the street-based residential network is connected as a part of the foreground network between the centers. The foreground network comprises a relatively small number of longer segments and receives more movement. It forms a superordinate background network comprising a much larger number of shorter segments and receives less movement. The background network creates the local grid like a cluster. The integrated background network of spatial differences could also be articulated statically through the constituent of space. For this reason, the spatial configuration of space plays an influential role in the three domains of sustainability. The generic form of the organic city shaped by the interaction of three domains of reality is the way to reveal the spatial order of movement for the future growth of the community.¹³ The paradigm of spatial sustainability of the organic city depends on how we investigate its spatial form and explain its universal properties in the complex street network. Moreover, "(...) complexity are the means through which economic and social forces find spatial expression in space, with the relation between local and global organization perhaps the single most critical factors."¹⁴ In addition, street networks' local and global structures explore the core analysis of functional patterns. The syntax idea of space responds to the spatial economic and social movement that transforms the city into a shape of spatial difference of urban form. "The fact that everywhere now the street life of cities seems to be becoming intensified is perhaps the most optimistic sign that the direction of change of cities in the twenty-first century will be back in the direction of the universal culture of the street."¹⁵

Urban core

The spatial methods of movement pattern and functional correlation in the urban structure are the concepts of the generic dual form, a foreground network of linked centers at all scales, which is set by the background network. The centrality is diffused universally in the spatial system of the integrated city structure.¹⁶ Rapidly growing cities are generating or spreading more gridded areas, where organic centers are emerging in the varying radius values in the grid system. Each center is identified with a comparatively higher value of the street segments than others, which act as local seeds for developing the new centers. This intricate pattern of centers at all scales is a potential dynamic component for spatial development growth. It is not a matter of distance; the intelligible distance created by the network's angular distance and center fit in this natural pattern movement at different scales. For this reason, each center is part of a natural movement pattern at a specific scale that is "(...) pervasive centrality, meaning that the function of centrality pervades the urban grid in a far more intricate way, (...) for example notion of polycentricity."¹⁷ However, emergent multi-scale patterns of linked centers arise through a well-defined self-organization process based on the relationship between grid structure and movement at all scales. Syntax analysis advocates centers are formed or evolved in the urban grid where there was a coincidence of global and local factors.¹⁸ The intensification of the grid creates easy accessibility to the higher number of local segments, and it is the three-dimensional factor that reinforces the growth of a center that transforms the space from private to public use.¹⁹ Conversely, "Every center has a center, it starts with a spatial seed, usually an intersection, but it can be a segment. The seed of a centre will have destination and route values at both global and local levels."²⁰ Reinforcing the initial or original seed to the spatial degree is the effect of new seeds created by the grid in the continuous process of urban growth. It is termed a system of the urban core, and the center then expands in two ways: linearly and convexly. The spatial strength of the center is varied, as are its global and local functional integration properties. In addition, the center's scale and physical character are the spatial differences in balance between global and local terms.²¹ Centers are also growing or dying or blending into the process of urban integration with neighboring centers at different scales, where some potential local centers lost their spatial identity due to the close existence of other dominant centers. How the urban grid evolves tends to ensure that the seeds of potential centers need a certain degree of spatial relationship with different forms of urban structure, such as water, territorial landscape, etc. In the contemporary growth of the urban grid, the spatial urban core is frequently transforming its embedded spatial position.²² That is a vital cause for transforming land use patterns into the mixed-use model and changing its surrounding environmental settings through spatial disorder.

Spatial centrality

Dhaka city's syntax analysis (Rn) shows that spatial centrality (Figure 4) generates more spatial movements in the city center. This urban core of spatial centrality is rapidly growing with linear movement in the north direction. It reveals four integrated north-south linearly oriented Primary (i. Mirpur road, ii. Begum Rokeya Avenue, iii. Old Airport road + Shaheed Tajuddin Ahmed Avenue + Dhaka Mymensingh Highway, iv. Progati Avenue + DIT road + Atish Diponkor Road) streets, where the urban core (red) is embedded in this system. They integrate different scales of urban centers and the growing north part of the city. Frequently, transforming the spatial dimension of the urban core from the old (south) to the new part (north) of Dhaka city in this contemporary city structure creates a complexity of urban morphological growth and the land use structure of the city. The most integrated neighborhoods of the city are being transformed from residential areas to mixed-use development. This rapidly expands core values, destroying surrounding territorial natural values by increasing spatial land values for further unplanned urban development. New emerging geometric grids (The names of the emerging urban grids of satellite towns are Purbachal, extension of Basundhara residential area, United

City, Green model town, Aftab Nagar, Ashiyan City, etcetera in the east and Nabi Nagar Housing in the west) are more visible in the city's eastern part, in the lowland area. They are also rapidly increasing the urban core values by decreasing the environmental core values. Conversely, peri-urban street structures are in the lowest integration value (blue), where territorial street structures are disconnected and separated from the grid of the urban core. The maps of local integration (Figure 5) reveal the drastic spatial segregation scenario. This local integration (R10) map of syntax analysis depicts how the space patterns of formal and informal street networks are spatially distributed with their local integration of core values. Formal neighborhoods are in the highest integration value; informal neighborhoods are dispersed in the lowest integration values. The investigation shows that the informal layout is spatially separated from the formal integrated design system. Informal layouts are less accessible and less connected with the foreground network.

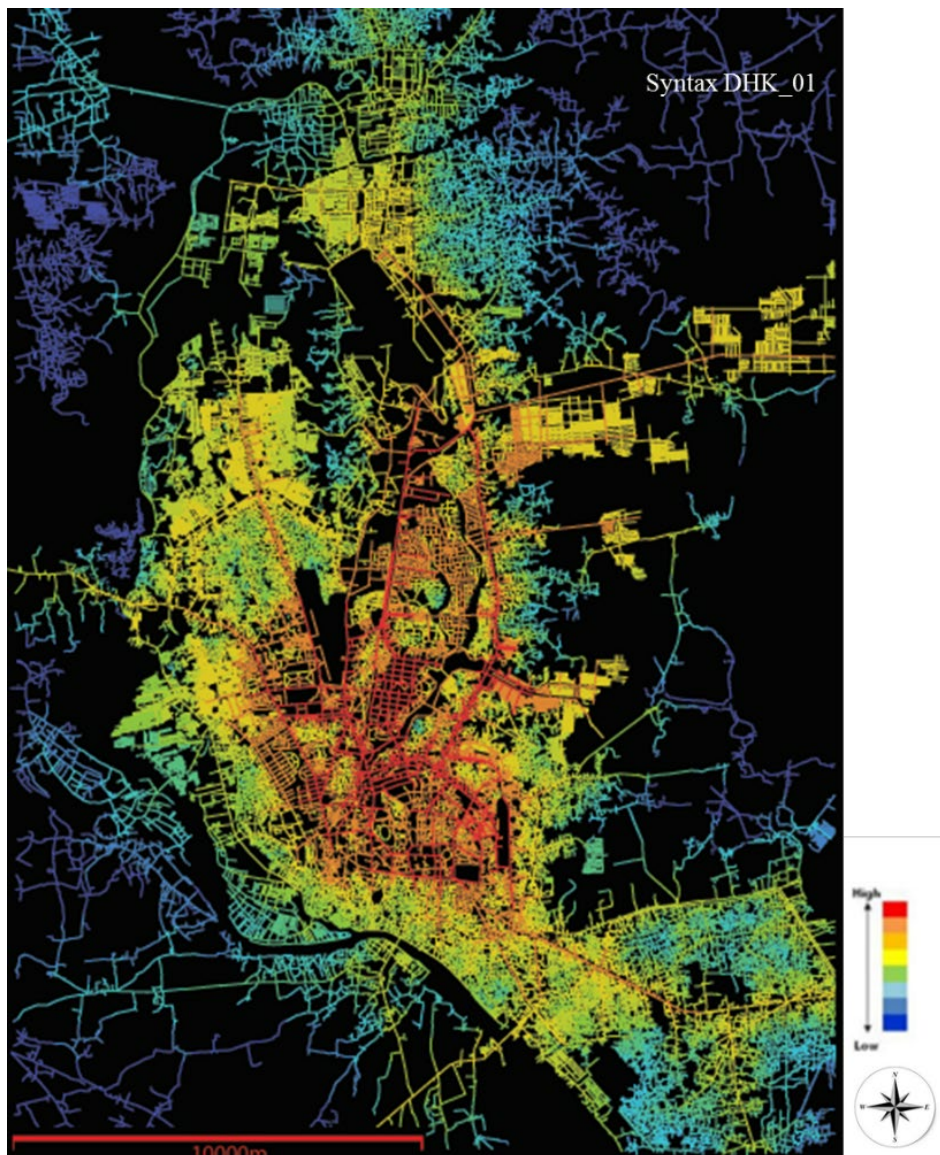


Figure 4. Global integration [HH] Rn of Dhaka city.

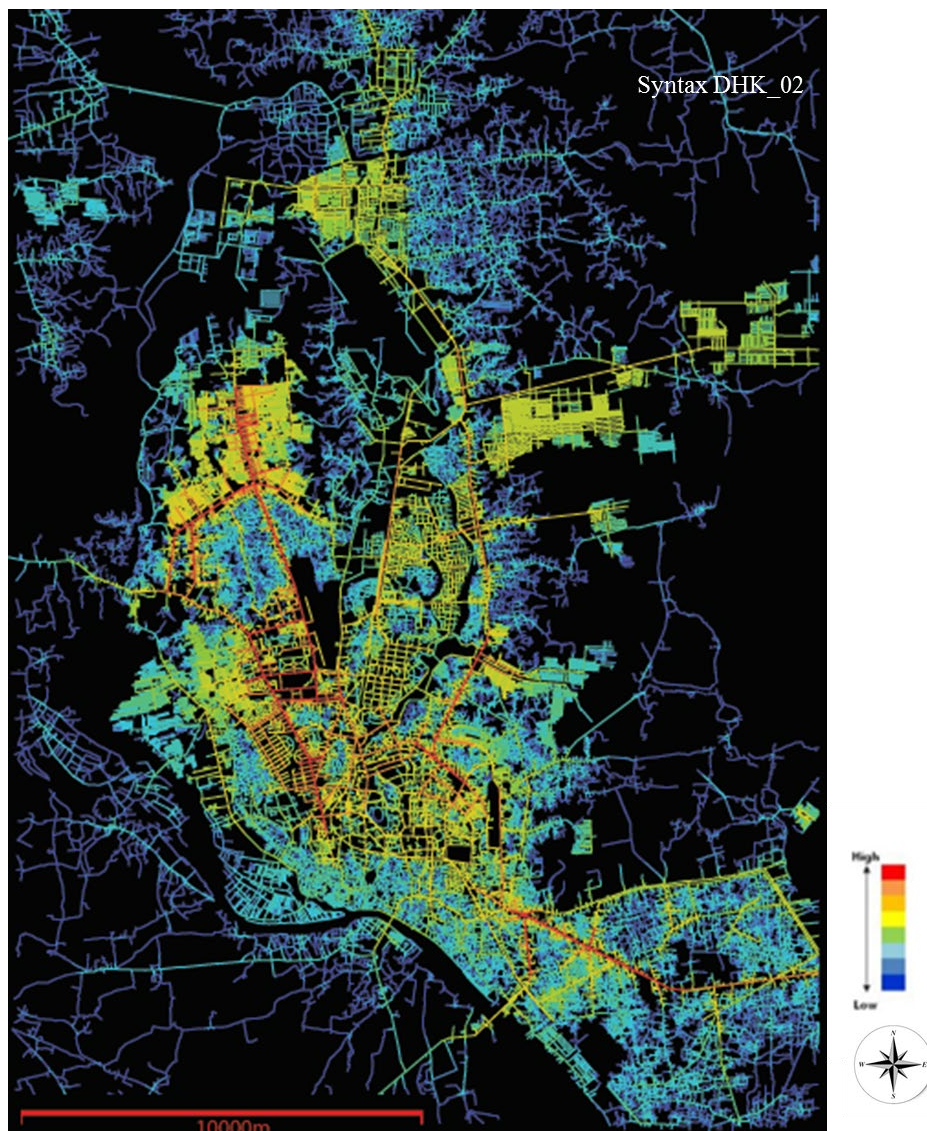


Figure 5. Local integration [HH] R10 of Dhaka city.

Formal neighborhoods are well-connected through foreground networks. They rapidly transform their existing land use structure from residential to mixed-use development to a higher degree of integration and connectivity. Due to the lower integration value, informal street structures are comparatively denser with the residential land use character of informal development, and the major part of the city structure is the informal structure. This city structure is spatially interpreted as a background network in the whole system of urban grid structure. Informal neighborhoods are densely sprawling inside and outside the city grid. Then, its growth is also accelerating urban expansion in the lowland area next to the water bodies in this contemporary city structure. These large-scale uncontrolled or self-organized growths of informal city structures transform the urban and peri-urban space into a complexity of the transition to space and the link between the natural structures like the water bodies, lowland areas, etc. As a result, peri-urban land is rapidly transforming into an informal grey space. These impermeable informal discontinuities of street spaces are spatially visible between two formal structures, between formal and territorial structures, or at the urban border or periphery of water bodies. This large scale of unplanned, growing concrete floors creates a high barrier to open the city sky to the natural landscape. However, this less accessible and dense concrete floor of informal layouts concealed the urban and periurban open space by giving the backyard of disconnected space to all-natural structures. Its continuous growth on

the peri-urban landscape destroys the water bodies, agricultural land, floodplains, lowlands, and wetlands without any spatial relationship to the city grid. Those natural resources are occupied, and physical space is transformed into abstract space, an unsustainable way of city growth. However, the linear integrated lines transacted through informal neighborhoods generate mixed-use activities along that street space. Lack of proper urban planning and management of informal layouts is rapidly increasing grey space without adopting biodiversity in the informal space.

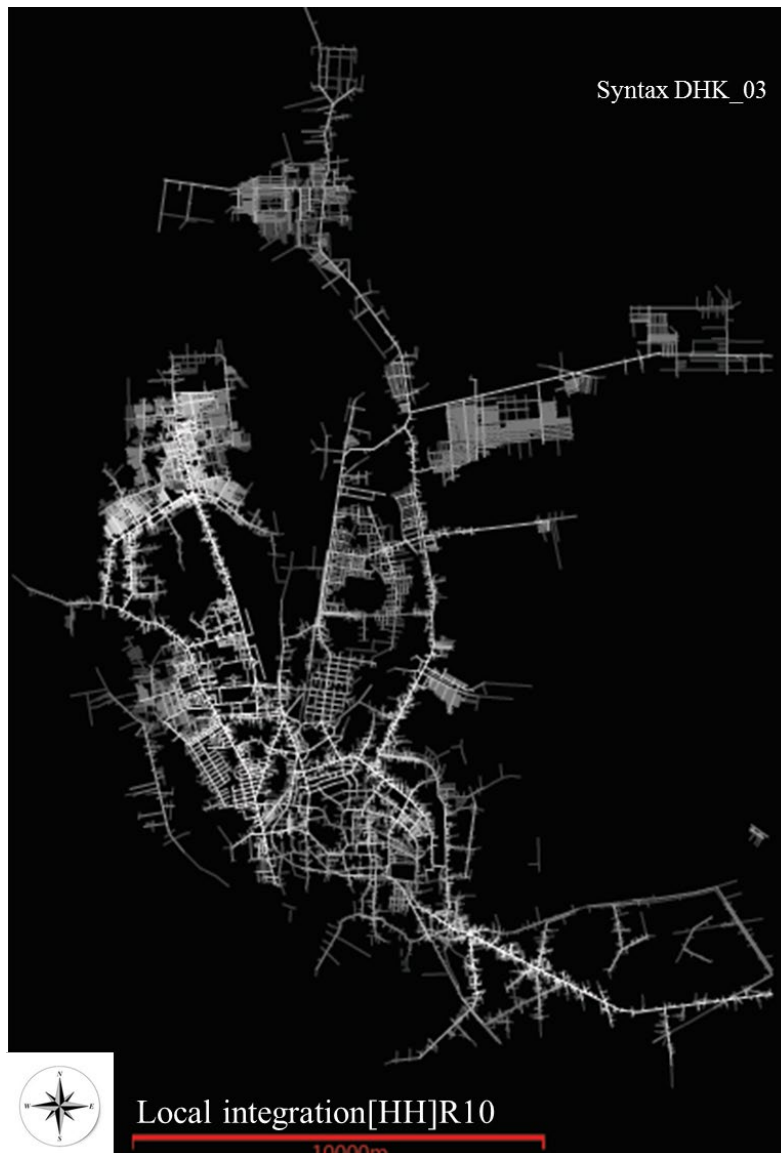


Figure 6. Foreground space network of DHK.

Ignoring the development of open spaces in the informal street structure isolates those neighborhoods from the integrated urban grid. The city authority and private real-estate developers are continuously extending the urban grid of formal structures in the surrounding lowland area without respecting the territorial landscape. Those emerging formal structures, so-called satellite towns, are also sprawling and spreading their grids beyond the urban borders of the city. Urbanization is captivatingly implemented rather than facilitating the complex grid system's natural structure and environmental flow. It inconsistently increases global integration values of spatial centrality, terminating the spatial position of the existing urban core. Those dispersed developments of urban growth encouraged informal patterns

of urban growth in-between the space of formal structures. The spatial control of local integration reveals that their independent spatial centrality also reinforced informal layouts around the formal structure due to a lack of proper urban land management or planning guidelines. Figure 6 illustrates the foreground network in the spatial control of local integration (R10) of the spatial structure of Dhaka city. It confronts all scales of residential and mixed-used formal layouts, emerging formal layouts, CBD (Central Business District), the formal layout of the commercial zone, and their linear network of connectivity. The spatial investigation shows that the pervasive centrality is materialized on the foreground network in both global and local dynamics of the urban grid. For this reason, the high movement potential and robust economic activity are driven by the foreground network of the city structure. As an effect, the residential formal structures in the foreground network are influentially transforming land use patterns. On the other hand, a less integrated residential informal inaccessible network has lower movement potential and space activity driven by the background network. The background network is spatially separated from the foreground network and is an incredibly densely populated space for lower and middle-income residential urban growth. The impact of spatial segregation declined social living conditions and biodiversity in the contemporary landscape. For this reason, this contemporary city is not growing homogeneously by upgrading its degraded background space and network value. Instead, the city is looking for new natural space for further urban extension for the sake of urban growth and the housing crisis. Although those issues are vigorous, upgrading spatial space is far beyond the implementation of contemporary thought of urbanization. The weak spatial integration to the foreground network social centers and open spaces develops in a disordered pattern and is transformed into a dead space due to the lack of proper accessibility.

SPATIAL LOCATION OF FORMAL AND INFORMAL STRUCTURE

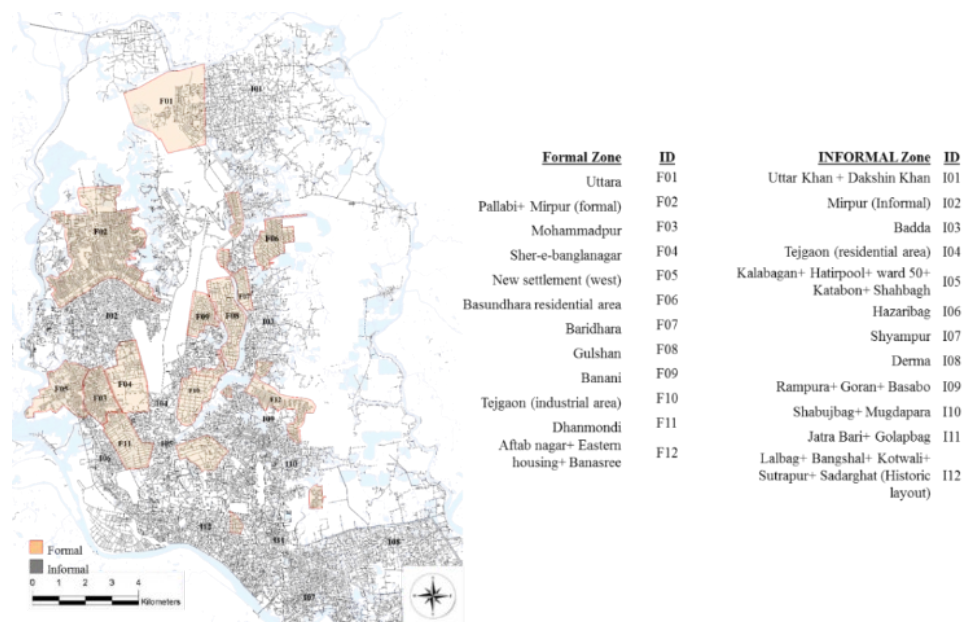


Figure 7. Location of formal (F01-12) and informal (I01-12) zones within the urban grid of DHK.

The above figure shows the spatial location and identity of formal and informal street layouts of different scales of neighborhoods. Besides the thematic investigation, the average syntactic variables of formal and informal zones are examined based on axial segments of street structures. The spatial position of formal and informal zones is demonstrated with the spatial position of water to explore their quantitative values in the embedded urban grid system. The dispersed area of formal zones is plugged

into the different locations of the metropolitan city grid. The informal zones are overextended in-between of spaces in this contemporary city structure. The tables below also show their individual global and local average integration values (Tables 1 and 2) in the embedded system of the urban grid.

Area [Formal]	ID_Zone	Count [SEGMENT]	Global integration[HH]	Local integration[HH]R10
Uttara	F01	806	0.7102	0.9988
Pallabi+ Mirpur (formal)	F02	2644	0.3174	0.603
Mohammadpur	F03	796	0.7781	1.111
Sher-e-banglanagar	F04	463	0.8303	1.1684
New settlement (west)	F05	352	0.6091	0.9041
Basundhara residential area	F06	218	0.3528	0.6367
Baridhara	F07	102	0.8708	1.2478
Gulshan	F08	305	0.36	0.6189
Banani	F09	147	0.8713	1.1926
Tejgaon (industrial area)	F10	252	0.3779	0.5928
Dhanmondi	F11	179	0.8578	1.296
Aftab nagar+ Eastern housing+ Banasree	F12	273	0.3491	0.5345
Total		6537	7.2848	10.9046
Average		545	0.6071	0.9087
Maximum		2644	0.8713	1.296
Minimum		102	0.3174	0.5345

Table 1. Syntactic variables (global and local) of formal areas of DHK as an embedded system.

In the formal layouts (Table 1), Uttara, Mohammadpur, Sher-e-Bangla Nagar (It is a bustling commercial and central neighborhood designed by architect Louis I. Khan. Completed in 1982, the National Parliament building within this capital complex holds significant local and international impact); Baridhara, Banani, and Dhanmondi zones are highly integrated with the embedded grid system. In addition, other formal zones are comparatively less integrated. However, all formal layouts are united actively as a foreground network, where Dhanmondi is globally and locally more integrated. Comparatively, the large formal Mirpur neighborhood is less integrated with the syntactic grid system.

Area [INFORMAL]	ID_Zone	Count [SEGMENT]	Global integration[HH]	Local integration[HH]R10
Uttar Khan + Dakshin Khan	I01	4788	0.4817	0.6819
Mirpur (Informal)	I02	4112	0.3053	0.4309
Badda	I03	3481	0.6359	0.7181
Tejgaon (residential area)	I04	1396	0.362	0.5626
Kalabagan+ Hatirpool+ ward 50+ Katabon+ Shahbagh	I05	603	0.8487	1.1323
Hazaribag	I06	1706	0.6733	0.8774
Shyampur	I07	3331	0.3029	0.4685
Derma	I08	4795	0.5878	0.815
Rampura+ Goran+ Basabo	I09	1593	0.7235	0.8211
Shabujbag+ Mugdapara	I10	1850	0.2748	0.3402
Jatra Bari+ Golapbag	I11	1170	0.7533	1.0134
Lalbag+ Bangshal+ Kotwali+ Sutrapur+ Sadarghat (Historic layout)	I12	4510	0.3037	0.4113
Total		33335	6.2529	8.2727
Average		2778	0.5211	0.6894
Maximum		4795	0.8487	1.1323
Minimum		603	0.2748	0.3402

Table 2. Syntactic variables (global and local) of informal areas of DHK as embedded systems.

On the other hand, in the informal layouts (Table 2), zones I05 (Kalabagan, Hatirpool, ward 50, Katabon and Shahbagh), I06 (Hazaribag), I08 (Demra), I09 (Rampura, Goran, Basabo) and I011 (Jatra Bari and Golapbag) are highly integrated in the embedded grid system. Other informal zones are less integrated. However, all informal layouts are dispersedly active as a background network. Zone I05 is globally and locally more integrated. Moreover, zone I10 (Shabujbag and Mugdapara) is a less integrated informal neighborhood in the syntactic urban grid system. The above tables show that the average global (0.607

> 0.5211) and local (0.9087 > 0.6894) integration values (The quantitative average values of global and local integration in the embedded is generated from the thematic maps of syntax analysis in Figures 4 and 5) of formal layouts are comparatively higher than informal layouts in the embedded system of the city structure.

COMPARISON OF FORMAL AND INFORMAL SPACES

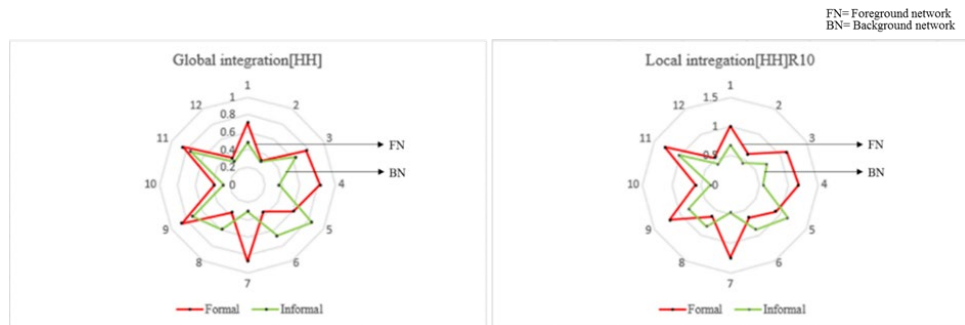


Figure 8. Comparison of global $[HH] R_n$ and local integration $[HH] R_{10}$ model between Formal and Informal spaces with the use of syntax analysis [syntax map Figure 4 and 5].

The correlation values of global and local integration of formal and informal space networks (Figure 8) illustrate that the foreground network (red) of formal space structures is more dominating and interconnected than the background network (green) of informal space structures in the contemporary embedded system of the emergent urban grid. On the other hand, the investigation indicates that three formal neighborhoods in the foreground network are comparatively less integrated (F08, F06, F05 < I08, I06, I05) than the informal neighborhoods in the background network.

Spatial adaptation

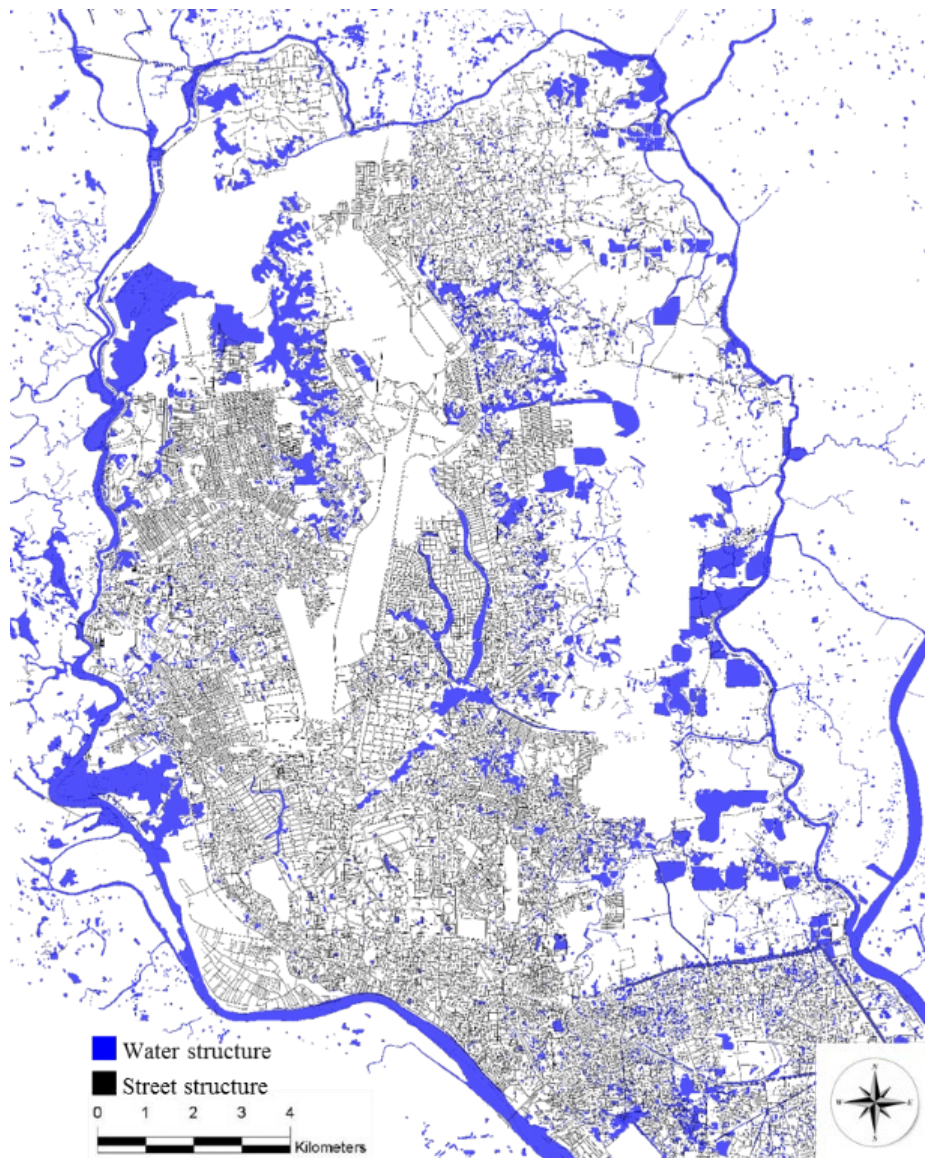


Figure 9. The water and street network of DHK exist.

The network of the street and the water morphology of the metropolitan area is necessary to reform from the evolution of the spatial connectivity of movement's pattern and environmental flow. Building a homogeneous urban core growth is enrooted in the physical structure of the city grid. Functional structures adjacent to the urban core, like rivers, water bodies, lowlands, floodplains, deltaic plains, wooden land, green structures, open spaces, etc., are vital to interweave with a variety of networks for increasing diversity of movements and bring back the social life into the space. The water and street transportation system network of the metropolitan area of the city consists of peripheral water structures (river networks), planned (geometric grids), and unplanned (self-organized interrupted grids) street layouts (Figure 9). Street structures occupy 6 percent, and the water network occupies 7.5 percent of the city. In this complex grid of streets, the transportation system is distributed into primary (199 kilometers), secondary (109 kilometers), collector (152 kilometers), and access road (1540 kilometers). Conversely, about 109.23 kilometers of water access is topographically embedded in the periphery of the administrative city area, where only 5.46 kilometers in the west part of the city (Figure 9) is hardly

used for public transportation. These potential water access routes are not integrated into the man-made, formal street structures. However, these emergent water loops of the metropolitan area are now intense for all trade and regional transportation. Those peripheral crisscrossed water networks create a strategic entry point for the city on the historic river Buriganga, located in the south of old historical towns. This strategic water transportation hub is inadequately integrated into the city grid structure. Although those subsequent water loops are not well integrated into the city grid, they are highly used for territorial water transportation. Figure 9 demonstrates the water and street network of the metropolitan city of Dhaka, where many internal canals and lakes can reconnect the existing water loops for green transportation through water. It also illustrates the possible easy access to integrate the territorial neighborhoods and internal city grid without traffic interruption. The existing potential water networks could quickly transform and reveal the character of the water landscape in the inner part of the city, where it was a byproduct of natural topography.

Adopting environmental flow could also open up the city sky in the peri-urban landscape by giving access to city dwellers. Water-related spatial movements could transform urban-to-periurban space socially and physically, defining the spatial integration of the existing functional structure of the contemporary, refined city grid structure. However, [re]structuring and [re]regulating water and street structure together needs spatial control to [re]integrate people and movement patterns into this developing urban grid. The spatial local integration of a complex urban grid (Figure 10) and water network shows that the embedded foreground networks are spatially disintegrated around the peripheral water loops and internal water bodies. Although the city has a constructive potential to evolve the existing water system and emerging dual network of the urban grid for developing future growth of water strategic transportation points, the city is derived from this spatial advantage of urban movements. The syntax map of Figure 10 also depicts the intersection of the foreground network (red to yellow) next to the water (blue) structures, where it shows that the possible strategic water routes could be interconnected with the foreground network. Even though the formal growth of urban structures is not developed next to the water, the background network (green) of informal growth is spatially in the reverse direction. The informal layouts of the background network densely occupy the urban border, river banks, lowlands, and peripheral water bodies. As a result, it transforms the urban grid into less accessible space for the peripheral water systems and open space of the peri-urban landscape. Finally, the sprawl of a large-scale background network spatially hides that potential space of water structures and transforms them into the backyard of space in the city. It also separated the internal water bodies with degraded spatial access next to the water and lowland area. The vacant space next to the water is rapidly occupied by slum settlements or the illegal growth of factories. Then, the water bodies are used for household and industrial wastewater discharge. Continuously using the water bodies for natural drainage, the city is losing its potential water and ecological urban network to the peri-urban network. Today, the polluted water bodies are converted into the backyard garbage space on the city grid. However, water is an emerging contemporary tool to connect urban and peri-urban landscapes spatially through the development of foreground networks and background networks of spatial movement for the future growth of the urban grid system of Dhaka city.

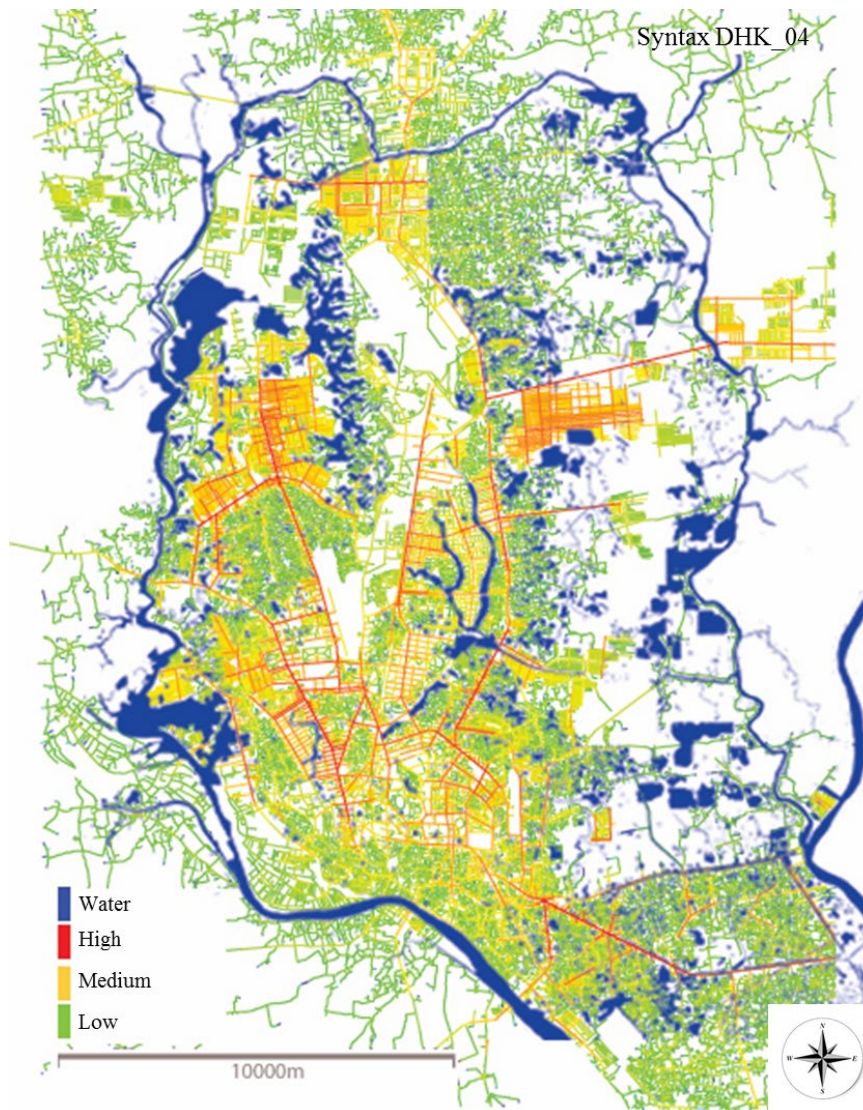


Figure 10. The water and street network of DHK exist.

CONCLUSION

The city is a solidarity of space, and water is the way to define the cohesion of space. In the case of Dhaka, where the city is fragmented internally and externally, waterfront development is an opportunity to resolve the fragile characters in the inner space and the boundary of the city and territory. The spatial measurement of the city and its boundary makes space more compact and substantial, a change to the natural topography, as has Dhaka. Despite the rapid transformation of space, the waterfront maintains the city's frontier, territorial inherent, and unalterable stability of the natural landscape. On the other hand, internal dense areas of the different forms of the neighborhood could regain the quality of biodiversity from the development of water edges so that the waterfront comes alive and becomes a place to dwell, recreation, and breathing space for a contemporary concrete dense floor. However, the primary urban grid of Dhaka can integrate with the city's internal and external water network for developing water transportation and ecological corridors. Existing lowland areas are a fundamental part of regenerating the biodiversity in the city and moderate the risk of man-made climate change about water issues. Therefore, developing the water edge could deliberately unite the city center and its territory into a unique harmony of space.

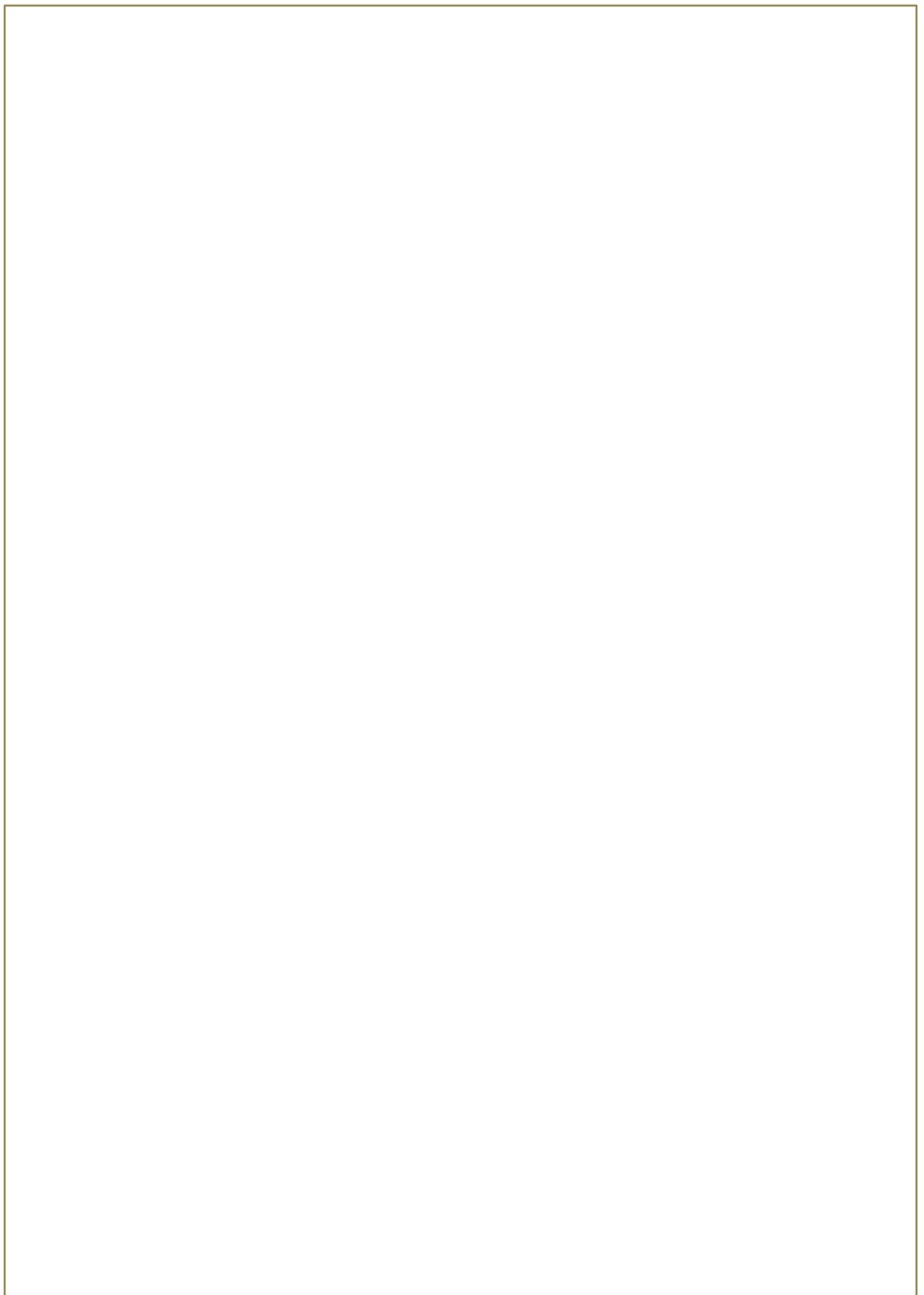
NOTES

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- ² Jane Jacobs, *The Death and Life of Great American Cities*, 3rd ed. (New York: Random House, 1961).
- ³ Christopher Alexander, "A City is Not a Tree," *Design*, no. 206 (February 1966): 46–55.
- ⁴ Cemil Atakara and Mitra Allahmoradi, "Investigating the Urban Spatial Growth by Using Space Syntax and GIS—A Case Study of Famagusta City," *ISPRS International Journal of Geo-Information* 10, no. 10 (2021): 638, <https://doi.org/10.3390/ijgi10100638>.
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- ⁷ G.M.A. Balayet Hossain, *The Intelligence of Urban Network: Movements and Life* (Deutschland: LAP LAMBERT Academic Publishing, 2012).
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