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Livable Cities: A Conference on Issues Affecting Life in Cities

INTRODUCTION

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What makes a city livable? Transport, housing, health. Open space, mobility and the environment. Matters of culture, entrepreneurship, crime and safety. Affordability and access to education. Depending on whose 'livability index' you look at, it may include design quality, sustainability and the digital infrastructures of the smart city. Other criteria applied may encompass food access, job opportunities or walkability. Inclusivity and the politics of participation also come into play. Discrimination in all its forms impacts livability and social and political equity.

The past two decades have seen an exponential rise of livability measures. Reflecting increased urbanity globally, they risk making the notion of the city ever more contested. The two cities that host this event are cases in point. The Mercer Livability Ranking takes New York as the datum by which all other cities globally are graded – as better or worse. London, by contrast, measures itself: the London Assembly scoring everything from air quality to indices of deprivation. When we consider the livability of cities then, it is clear we are dealing with a plethora of issues – both isolated and, inevitably, interconnected.

Responding to this scenario, the papers in this publication tackle these issues above from various angles. They examine how we live in cities, and how every issue we encounter morphs with considerations of others, whether housing, architecture, urban planning, health, IT, crime and safety, city management, economics or the environment.

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CONSIDERING MUSIC AND LIVE PERFORMANCE AS A TOOL FOR COMMUNITY SOCIAL WORK PRACTICE

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INTRODUCTION

The connectivity of music and the arts as a form of healing has a long history but not fully viewed as a social work clinical practice, even though social workers have been incorporating the arts in their work for decades. There are opportunities to utilize music and creative arts therapies within social work practice to support self-expression and community bonding.

It is well documented that music aids in comforting the individual, but what if music could bring healing to a hurting community? "[A] social justice counseling approach uses social advocacy and activism as a means to address inequitable social, political, and economic conditions that impede on the academic, career, and personal social development of individuals, families, and communities.[1] Advocacy Competency Domains were created to aid counselors in having a framework for advocacy at a micro, mezzo, and macro level. [2]

LIVE PERFORMANCE FOR HEALING

We have seen examples of how music festivals could bring peace and happiness to struggling communities. In 1972, Wattstax was a benefit concert in Los Angeles to remember the tragedy of the 1965 Watts Riots and to support the community with funds for medical and educational resources. The 2021 documentary Summer of Soul covered the 1969 Harlem Cultural Festival, showing approximately 300,000 people gather over six weekends to see concerts in which tears, laughter, and renewal transformed spirits and the neighborhood. While the Harlem of 1969 is not the gentrified location New York is familiar with now, the challenges of life in a large and diverse city impact everyone.

While the arts give an expression voice to BIPOC (Black, Indigenous, People of Color) communities in the US, more support is needed to defend and ease the burdens of the people. Social Work can be a way to seek clarity about the roots of one's trauma and how to overcome its negative impact. Striving to help communities overcome the weight of racism, oppression, economic and educational inequality, and food insecurity blended with the insult of gentrification requires both clinical and social justice lenses.

Music can have a place in social work practice, and social work should have a place in music festivals, serving as a change agent to connect with the community before, during, and after the event to see to the therapeutic needs of its members/audience. Counseling access to tangible resources and researching for future creative collaborations are just some of the ways in which social work can

guide music festivals in being a source of community healing by shaping the event space to be inclusive and emotionally safe for both audience and artists.

SCOPING REVIEW

A scoping review was conducted to find information relevant to the topic of live music as a tool for social work practice in communities, looking for studies linking live music performances to social work practice. The review considered experimental and quasi-experimental study designs including randomized controlled trials, non-randomized control trials, before and after studies and qualitative studies that focused on data including qualitative description, observational study designs (individual case reports and descriptive cross-sectional studies for inclusion).

The review was conducted using the guidelines which included: identifying the research question, identifying relevant studies; study selection; charting the data; collating, summarizing, and reporting the results.[3]

Search Strategy

PsychNet, PsychInfo, and SocIndex were the primary search engines; a session with a New York University Librarian also assisted in the search. Utilizing the following key words: audience research and social work, music, music therapy, live performance and community- approximately 10.276 articles were found. Paring down the criteria to articles in English, articles that were peer reviewed, and articles within the date range of 2001 to 2023, the number reduced to 1,456. Reviewing the abstracts, the more relevant articles reduced to 822. After further scrutiny of abstracts and articles, the most seemingly relevant works (113) were imported into the research program Covidence. 34 articles were found to be irrelevant in the first title and abstract screening. 76 articles were screened, 42 went to full text review, and 12 studies were identified for data abstraction. An additional 8 articles were found separately and included in this review.

Inclusion and Exclusion Criteria

The inclusion criteria for the chosen studies included peer reviewed journal articles, community, adult participants; exclusion criteria included children, adolescents, and afterschool programs. There was one exception- a study involving music instruction in schools; however, this study was within the context of community practice. [4]

Results

A search through the literature found very little research directly connecting music and social work, but some key themes revolved around audience engagement and emotional responses to the arts, and community-based performance groups. These themes aided in discovering some commonalities across fields, and how social work could effectively fill the gaps for more comprehensive and sustainable support.

NARRATIVE REVIEW

Healing through Music Instruction in Schools

Studies about Colombia's Batuta National Foundation's 'Music for Reconciliation' program were done to understand the changes in the social fabric of citizens displaced due to violent events in Colombia and benefits of belonging to a collective musical program in a effort to reconstruct the social connections of the participants.[5] The vital elements identified included familial, social, and institutional networks, resources-precarious or sufficient- and the similarity of the experiences of the participants. The qualitative study analyzed 14 life stories and 70 sound postcards across 7 families

who were victims of violence and belonged to the musical program. Participants included members of the families and 10 teachers of the music program. Research was conducted over a period of six months, in four cities in Colombia, spending about a month in each city. [6]

The Music for Reconciliation study shows how collective music spaces aided in breaking the sense of anonymity and isolation by creating new networks, helping members rebuild confidence in themselves and others through temporary identity in music and peace. Limitations were primarily location-based- the study was done solely in Colombia; the researcher noted that although the study could not be generalized due to the small sample size and location in four cities, similar music-based community organizations may find benefit in her research. [7]

The narrative research method was chosen for this 2020 study and three interviews detailing before violent events (BE), during the violent events, and after violent events (AVE) which led to the displacement were conducted. [8] Sound cards (sound postcards with the participants' interviews scanned on to the page) were a tool used to deepen the life stories. The researcher refers to socioacoustics as a study of sociality through its relationship with the music school. [9] A similar concept is psychoacoustics- the psychological study of the relationship between sensory perception and physical variables. [10] The use of sound cards, approved by the University's ethic committee in 2016, was to recall sound memories and recognize the changes. These pictures with sounds were requested at various times during the interviews, to record the changes in the soundscapes of the social fabric of the interviewees at different stages of their lives. Subsequently, an analysis of the qualitative information was carried out by means of specialized software. [11] The research sound of BE revealed the participants recalling family members, animals, neighbors, and an abundance of resources. The researcher's data indicated a dramatic decline in family networks AVE but very little change in social networks. The increase of institutional involvement doubles AVE, supporting the need to gain food, shelter, and education.

The Batuta music program stood out as a place where participants not only gained instrumental skills but also felt welcomed, valued, and able to express their opinions.[12] This program serves as a defining point for participants to manage the impact of the violent events experienced by themselves or family members. The researcher concludes that the music programs in the Colombian cities play a vital role in aiding participants in regaining a sense of community and social connections. Even though the original sense of family and society may not be the same, Batuta provides the possibility of repairing social fabric.

The researcher's work is similar to the presented question of live music being a part of a social work mezzo practice to support BIPOC communities and is a revelation and hope for research to come in this topic.

Audience Engagement

Audience response and engagement shape the success or failure of any live performance. The following studies look at the audience as emotive beings responding to classical music and as factors to a feeling which spreads throughout the venue. The inequity of audience attendance is seen through economic, cultural, and health lenses. As social workers, we can contribute to the production of audience research; we are investigators, interviewers, and reporters. These types of studies enrich our knowledge base to support communities in the pre-and post- performance timeframe.

A research study was conducted to test for the impact of aesthetic judgment on various psychophysiological responses measures of emotion at the University of York in the United Kingdom.[13] Their quantitative study included 98 males randomly divided into two groups to attend two concerts and a pre-concert talk – one was related to the music and the other was a non-music topic. Participants were monitored for physiological responses using optical earlobe sensors and

electrodes placed on the phalanges of the middle and index fingers. Data was also derived from the use of the Aesthetic Emotions Scale (AESTHEMOS),[14] a scale with 21 subscales with two items each designed to assess the emotional signature of an esthetic experience. The AESTHEMOS was merged with the Geneva Emotion Music Scale. [15] The results indicated that participants' aesthetic judgments were associated with subjective feeling and physiological responses, but not influenced by the pre-concert talks in either group.

This research is important for the deeper understanding of aesthetic judgment and emotional response to music. The study itself was not directly related to the topic question, but the usage of the ratings scales indicated a possible resource for gathering information as the research on music being part of a social work practice. It is worth noting that on the AESTHEMOS, the researchers purposely omitted items "emotionally moving" for both concerts as well as "like it", "was mentally engaged", "motivated me to act", and "felt a sudden insight" since according to the researchers' definition these items represented neither aesthetic judgment nor emotions. [16] From a clinical social work perspective, those items are very important and would be part of nearly every designed scale used in the field. Knowing and understanding all aspects of audience response would be beneficial to developing programming for live performances that promote healing.

Emotional Response

A study was conducted in 2020 to look at the impact of the amplification of emotional responses by the presence and reactions of other audience members, known as emotional contagion. [17] Mixed methods included using a post-performance survey given to participants. Audience members could complete the survey online or mail it back within a week. The survey consisted of demographic information, attendance patterns, a set of questions to measure audience response based on captivation, intellectual stimulation, emotional resonance, aesthetic growth, and social bonding; rate statements from 1 (Strongly Agree) to 5 (Strongly Disagree) in relation to how the participants had been influenced by the people around the during the performance; and the Ten Item Personality Inventory to measure whether particular personality traits are associated with a greater tendency to experience emotional contagion. [18]

The results of the survey indicated that 25% had no postsecondary school training; 39% had come at the encouragement of family members/friends; 59% made their own decision to attend; 90% attend classical music concerts before. Regarding results on emotional contagion, the highest rating was for participants who felt like they were "in their own bubble" during the bubble during the performance, while others felt that the responses of audience members influenced their responses. The smallest number was for participants who felt they had to restrain their own emotional responses because of the setting. [19] Future studies might explore more of the emotional experiences between members of the audience by focusing on unconscious motor mimicry such as facial expressions, posture, and movement. [20]

This study is limited to an orchestra of professional and amateur musicians in Sydney, Australia and therefore cannot be generalized. Still, for purposes of understanding how to support audience members from a clinical perspective, this information and data have some merit.

Inequalities in Audiences

Data was investigated to see if engagement in the arts is influenced by social inequalities. [21] Previous studies of American arts engagement did not factor in demographic and socioeconomic differences. The researchers utilized cross-sectional data from the General Social Survey [22], including demographic, socioeconomic, residential, and health factors. Combining data from 1993-2016, the sample size was 8,684 for arts events, 4372 for arts activities, 4,28 for creative groups, and 2,061 for

interested attendees. Data were analyzed using logistic regression to estimate the chance of events occurring.

Based on the data, higher education was associated with increased levels of arts engagement. Being female was consistently associated with higher levels of engagement. Lower income and social class had lower participation. However, the data reported that these factors were not associated with arts activities/creative group participation or interested non-attendee status.

It is not surprising that there was a social gradient in attendance to arts events, but not as evident in activities/creative groups. The researchers determined that there must be ways to reduce the barriers for the arts to be accessible to all. The implication of the need to lower the barriers solidifies the need for social work to be in collaboration with the arts because the field understands that music and the arts should be a right, not a privilege.

Seeking Ways to Bridge the Gap

The challenges of finding relevant literature and data are indicative of the separation of practices, leading to holes in the research fabric. Although many disciplines talk to each other, very few people are writing it down and sharing it with the academic community. It appears that when musicians and artists seek to discuss ways to share their knowledge for therapeutic benefits, they are not consistently using extensive research methods, resulting in imbalanced perspectives. Even when research is being done to find out how to resolve these challenges, the results fail to take the next steps towards producing the literature, leading to even more gaps. A prime example is a 2021 qualitative study [23] performed as part of an international scoping review to investigate the state of music-based interventions for mental illness and the need for interdisciplinarity. They discussed the concern that despite the large number of studies and findings, access to and application of music as a support or treatment for mental health remains limited. The great challenge is to synthesize the findings and research across disciplines into one concise study where the technical language, definitions, and outcomes are understood without boundaries. The researchers gathered a group of though leaders from relevant disciplines and participants who have experienced mental health issues for the study. The think tank included representatives from psychology, neurology, psychiatry, music, media, music therapy, neurosurgery, public health, and policy. While this study delved into the need for more rigor in arts-based research and that those interested in music therapy should receive enhanced training, there was a glaring omission that was frustrating and disappointing, but sadly not surprising. Social Work was not part of the study despite our interdisciplinary connection with all the disciplines invited to participate. It would have been beneficial to this study to have the field of social work equally represented and valued for its input.

Next Steps

Although there is an abundance of material related to the key words used in the search engines, once filtered to focus on social work practice, little is left, and even less is relevant. The studies revealed that music has a measurable effect on audiences-however, the samples were predominantly males in higher educational and socioeconomic levels. They also reveal that many non-attendees were of lower economic means; this is a large portion of the population we want to serve.

Some of the challenges found were the minimal studies conducted in the United States-many of the stronger studies were completed in Europe. There is also the challenge of language barriers-potential research studies in the search were in languages other than English, including German, Dutch, French, Danish, and Korean. The current amount of literature clearly shows the gap in research and the necessity to fill the gap with scholarly work.

The next steps involve sharing the findings of this review with three identified arts organizations in New York City to collaborate on a community needs assessment with the purpose of discovering how the community would like to receive the support and resources for healing. Conducting a needs assessment will aid in enhancing the organizations' programming, use the information to gain understanding of the community and what the community identifies as the priority for live performance support and healing. The process and outcomes will be shared in future papers.

CONCLUSION

The current research does not answer the question of whether live music performances can serve as a tool for mezzo social work practice, but there were glimmers of hope which aided in considerations for future work. The Aesthetic Emotions Scale can be used as a tool paired with naturalistic observation in the unstructured setting of performance space to gain insight into audience response and engagement. There is a gap in research, but as these gaps are identified, there is great potential for dig in deep and contribute to the body of knowledge.

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[21] Jessica K. Bone et al., "Who Engages in the Arts in the United States? A Comparison of Several Types of Engagement Using Data from the General Social Survey," *BioMed Central Public Health* 21 (2021): 2-3. https://doi.org/10.1186/s12889-021-11263-0.

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ZERO CARBON PRECINCT:
DESIGNING THE PROTOCOLS, OVERRUN AND DOMAIN OF ENERGY TRANSITION.

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INTRODUCTION

Zero Carbon Precinct is concerned with the re-forming and re-organisation of the architecture of cities in response to shifting energy paradigms – from fossil fuels to renewable energy, focussing on the intersection with the automobile, and its imminent electrification as an alibi to interrogate the states of entanglement of the car, urban design, architecture, and a staged liberation from carbon.[1]

Metropolitan culture – from dense urban aggregates to suburban sprawl is saturated by collective imagery and pervasiveness of the motorcar. No single entity, arguably, and certainly no other form of mobility has shaped the way we organise cities, infrastructures, economies, labour pools or even carve up a housing block, more voraciously than the car. The transition to renewable energy and the electrification of the car is a critical juncture that transforms its agency within the city.

The paper will describe and reflect on a design-research project that intervenes within an urban city block. The project explores the capacity of new energy paradigms to destabilise the matrix of rules and relationships that underpin the contemporary city, as well as the potential for new economies of localised energy production, energy distribution, living, working etc., with a focus on sites of scalable potential that become an immediate and perhaps exaggerated register for change.

How do we embrace the latent potential of a new energy architecture and its material realities? How do we reorganise the relationships within the built environment around an ecosystem of renewables? How does architecture escape the technology and of its extraction?

PREAMBLE

The transition from non-renewable to renewable energy sources necessitates a more profound contemplation of the conceptual and spatial landscape within the realm of architecture and urbanism in cities. Employing projective and operative prospecting methodologies, this research paper and proposal delve into a wide range of emergent opportunities, adaptations,[2] and latent potentials associated with the development of a new energy architecture and its material implications. By harnessing the built environment within a novel paradigm of temporal and responsive architecture and urbanism, this spatial manifesto puts forth an argument for a comprehensive reorganization of interrelationships within the built environment, centered around an ecosystem that supports localized renewable energy generation and production.

This research discusses an industry-partnered research project and a sequence of speculative urban and architectural projects – Zero Carbon Precinct, navigating through thematic agendas.

BUILDING SITE

Approximately 40% of the world's yearly CO_2 emissions are generated by the built environment. It is projected that by 2040, around two-thirds of the global building stock will consist of existing buildings. Unlike operational carbon emissions, which can be addressed by systems upgrades, embodied carbon emissions are secured once a building is erected. This increases the urgency to take precise action now. Projectively, the global building floor area is anticipated to double by 2060. Three materials - concrete, steel, and aluminum - contribute to 23% of the world's total emissions. The prime recipient of these materials is the construction industry.[3]

The dissociation between architecture and energy has been accelerated by the forces of modernity and globalization. Within this context, architecture has become introspective, narrowly focused on the act of building, and detached from the broader systems that influence our world. This detachment has engendered a mystical relationship between architecture as a practice and the act of construction, thereby obscuring the complicity of architecture within the intricate, interconnected, and seemingly infinite multiform systems that govern our existence.

The societal clustering around energy ecosystems extends beyond physical forces alone. Energy dependence manifests as an intricate web of covert connections, a labyrinthine system that permeates every facet of our daily lives. While power lines, data cables, and oil pipelines serve as visible manifestations of this ethereal interweaving of disparate threads within our global civilization, they are merely the tangible representation of a larger, hidden network.

The relationship between architecture and energy is complex and often overlooked. Architecture is frequently perceived as a solitary pursuit, solely concerned with the design and construction of buildings within the confines of project parameters. However, architecture is profoundly entangled with the flows of materials and energy, rendering it complicit in the extraction, distribution, and utilization of energy within society.[4] The act of building is not merely a technical exercise; it serves as a vehicle for expressing and articulating energy paradigms. As Brian Cody suggests, "form follows energy," and "architecture is energy."[5] This encapsulates the extensive discourse surrounding the deep and enduring association between architecture and the flows of energy and materials. Architecture and cities can be seen as attempts to optimize and manifest the movement of energy.

To unlock new possibilities for sustainability and resilience, it is imperative to recognize and rediscover this neglected reality, harnessing the power of energy and climate. This necessitates understanding the role of buildings in shaping material and energy flows and acknowledging the broader systems that influence the built environment. The liberation from carbon emissions will be a gradual and staged process, requiring temporal, scalable architectures, and interventionist practices. These approaches will encompass strategies for material containment, technologies for capture, distribution, and storage. These transient necessities will augment the instrumentality of the city and its architecture in the discourse of climate change resilience.

INVERT

The projects described in the paper were undertaken under the aegis of MINI Invert 4.0. This was the fourth iteration of an industry-partnered design research project with MINI, Green Magazine, RMIT University, School of Architecture and Urban Design and City of Melbourne. MINI is a brand pillar and subsidiary of the BMW Group. Continuing a legacy of design innovation and future-focused thinking, INVERT 4.0 considered the potential for cities to renewable energy sources and electric vehicles.[6]

INVERT 4.0 addressed growing concerns about the transition toward electrical vehicles and new energy paradigms, identifying that electric cars are likely to become the primary source of transport in coming years. But without appropriate access to charging stations, infrastructure, and integration

within architecture and the city, widespread uptake will stall and the move away from fossil fuels will inevitably be impeded.[7]

LITHIUM

Lithium that was once presented as a treatment for the fatigue that the capitalist economy exerted on the human body is now the lynchpin - encompassing economic, environmental, and social aspects in the transition to renewable energy.[8]
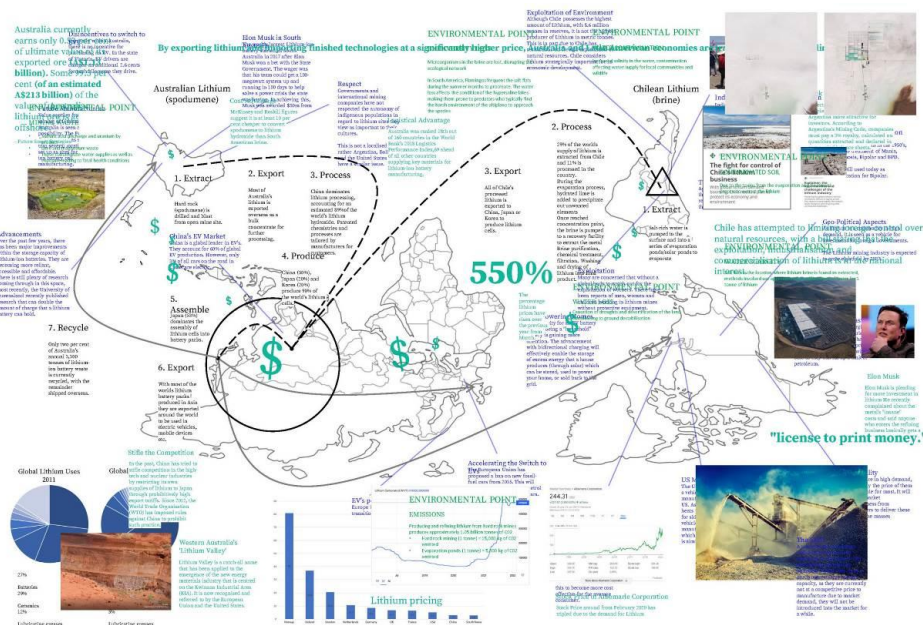
Figure 1. Extractive Mapping Diagram – by RMIT University Students: Riley Sherman, Matthew Samson & Joseph Short, supervised by Ian Nazareth and Lisa Gargano

As some extractive industries slow down, others quickly take their place. Lithium is considered as one of the most powerful resources we have in the fight against climate change. However, it is found in high concentration only in a few places on Earth, such as Western Australia and the Atacama Desert in Chile.

While it provides material for cheap and necessary batteries, we also need to reckon with its extractive processes that involve evaporating millions of liters of water every day in the world's driest desert.

These maps trace the 'route' of the mineral to a battery or power source while engaging with environmental, economic, and social discourses that occur through the processes of extraction, refining, processing, and manufacturing.

The Extractive Mapping Diagram is a project that attempts to capture the global environmental, economic, and social impacts of lithium. The map is flipped to represent the shakedown that is occurring as a majority of the world's lithium reserves are located in the Southern Hemisphere.

Yet by exporting lithium and importing finished technologies at a significantly higher price, Australia and Latin American economies are trapped in a cycle of declining terms of trade while also facing the social and environmental consequences occurring at the sites of extraction.

ZERO CARBON PRECINCT

Australia's low adoption rate of electric vehicles (EVs) can be attributed to various factors, including limited access due to high prices compared to mainstream car models and a lack of infrastructure to support widespread EV usage. Insufficient charging stations and a gap in charging networks across

the country, combined with longer charging times compared to refueling with petrol, have discouraged many people from making the switch. This issue is particularly challenging in urban centers, where space for setting up charging facilities is becoming increasingly scarce as population density rises.

The site is a city block, located immediately north of Melbourne's Central Business District (CBD). The precinct includes a petrol station, multi-residential buildings, and commercial businesses and organizations, which reimagines how to accommodate electric cars while creating a community hub that encourages local involvement in the initiative and fosters a greener environment. The aim is to integrate EV charging infrastructure seamlessly into the urban fabric while creating spaces that attract and engage the community. The INVERT 4.0 initiative gave the opportunity for practicing architects, and the wider community to participate in creating a sustainable future and facilitating the adoption of EVs in Australian cities.

Overall, the projects in this area seek to present immediate and exaggerated registers of change, exploring the potentials of new-field urbanism in the liminal overrun between the car, charging stations, communal spaces, distributed platform technologies, and peer-to-peer economies. By doing so, they offer a glimpse into a future where the car and the built environment are reorganized around an ecosystem of renewable energy, transforming the way we interact with the city and the culture of consumption.

Figure 2. MINI Invert 4.0 Exhibition Site Model by RMIT University Students, supervised by Ian Nazareth and Lisa Gargano

Project 1 - 'Achieving zero-carbon buildings'

This project is broken down into three approaches that look at 'achieving zero-carbon building', 'urban farming for carbon positivity' and 'reverse engineering for local material production'.

The 'Achieving zero-carbon buildings' approach uses existing urban infrastructure and the Degrave's Street recycling facility as a precedent. It addresses difficulties in sourcing sustainable materials and emphasizes the importance of avoiding demolition to minimize environmental impact. The approach explores strategies to reduce embodied carbon, such as on-site processing of recycled glass aggregates. It raises questions about the current state of the built environment and the need for innovative approaches to achieve zero-carbon buildings in urban contexts.

'Urban Farming for Carbon Positivity' proposes urban farming in an apartment complex using recycled plastic to create an organic scaffold for vegetation. The materials reflect red and blue light to aid plant growth, reducing the need for driving to supermarkets for groceries. The approach emphasizes the potential of urban farming to create self-sufficient and healthier living standards by integrating nature into architectural design, contributing to carbon positivity by absorbing CO_2 through plant respiration.

'Reverse Engineering for Local Material Production' proposes creating urban mines and material fabrication shops within construction sites to reduce the environmental impact of material extraction and transportation. The technique suggests using reverse engineering to produce materials that can be used locally as additions to existing buildings, promoting circular economy principles. This approach is presented as one of the options for achieving a zero-emission precinct and raises questions about the role of local material production in creating sustainable and regenerative architectural practices.

Figure 3. 'Achieving Zero-Carbon Buildings' Project by RMIT University Students: Luke Side, Fabrice Doutriaux & Marcus Hall, supervised by Ian Nazareth and Lisa Gargano

Project 2 - 'Self-Sufficiency'

The 'Self-Sufficiency' project proposes a sustainable approach to generate electricity for a zero-carbon precinct, incorporating four main divisions: energy absorption through solar panels, energy storage using a flow battery, an electricity exploration lab, and a public rooftop garden. By adopting a flow battery as a rechargeable fuel cell and utilizing tanks of electrolytes, the precinct achieves longer-duration and high-capacity energy storage, facilitating the integration of renewable energy into the electricity network.

The power generation process commences with the absorption of energy through concentrated photovoltaic units, which is then stored in vanadium redox flow batteries. These batteries,

strategically positioned on the building facade, efficiently transform and supply electricity to the residents, drawing upon the stored energy from the tanks of electrolytes and pipes. Additionally, the electricity lab functions as a dynamic hub for researching and developing innovative methods to generate renewable energy.

Furthermore, the public rooftop garden serves a dual purpose. It provides visitors with a serene and rejuvenating space to unwind, while simultaneously contributing to carbon reduction through the introduction of lush greenery. This holistic and sustainable approach to energy generation exemplifies the project's unwavering dedication to achieving a zero-carbon precinct, setting a precedent for environmentally conscious urban development.

Figure 4. 'Self-Sufficiency' Project by RMIT University Students: Zehai Li, Yuxuan Hu & Xinyun Zhang, supervised by Ian Nazareth and Lisa Gargano

Project 3 - 'In-transition'

'In-transition' challenges the idea of adaptively reusing not just buildings but also cars. Our proposal focuses on establishing processes today to enable an affordable, equitable, and sustainable transition from internal combustion engine vehicles (ICEs) to electric vehicles (EVs) in Australia, rather than solely considering the future impacts of EVs on our cities.

Through minor interventions at the Meat Market, the students have redesigned the space to incorporate battery storage and facilitate the temporary conversion of ICEs to EVs over the next decade. By prioritizing the conversion of existing vehicles instead of relying solely on new electric vehicles, it can reduce Greenhouse Gas emissions by 40 to 60% and prevent premature waste generation. Additionally, the design proposes cultural infrastructure and public spaces for the Meat Market to enhance its operations as a cultural and performance hub during nighttime.

*Figure 5. 'In-transition' Project by RMIT University Students: Riley Sherman, Matthew Samson &
Joseph Short, supervised by Ian Nazareth and Lisa Gargano*

Project 4 - 'Power Station'

The 'Power Station' is an innovative architectural project that reimagines the conventional service station typology and transforms it into a renewable power hub within Melbourne's inner city. Preserving the elements that society appreciates in service stations, this facility thrives in our renewable future, offering a unique experience for both locals and outsiders. It serves as a convenient stop where individuals can refuel their vehicles and nourish their bodies.

With its northerly aspect, the Power Station maximizes its potential through four levels of urban farming. Additionally, it features a solar-charged multi-level car refueling station at its core. This cutting-edge facility not only allows numerous people to park their cars and purchase fresh produce but also provides educational opportunities about urban farming. Moreover, the community gardens on the ground floor plaza area create a space for social interaction and community engagement.

Figure 6. 'Power Station' Project by RMIT University Students: Shaoxiong Guo, Pele Morrison & Tomasz Kloza, supervised by Ian Nazareth and Lisa Gargano

By utilizing these innovative approaches and more, the Power Station goes beyond the traditional petrol station archetype. It becomes a vibrant community hub that contributes to the well-being and sustainability of the area. This architectural project sets a new benchmark for reinventing common infrastructure and showcases the potential for architecture to positively impact communities in unprecedented ways.

Project 5 - 'Park, Work and Play'

The 'Park, Work and Play' project aims to transform a conventional car park into a dynamic and eco-friendly car park/offices complex that relies on renewable energy generated from organic waste. The aim is to revitalize the old car park typology, which was once private, cold, and environmentally unfriendly, into a vibrant and sustainable space. By utilizing the car parking area, the space can be rented or hired as temporary offices, venues for small events, cinemas, or exhibitions when not in use for parking. Each parking lot can be separated by curtains, offering users a sense of privacy within a shared public space.

This transformation turns the car park into a lively environment where office workers can enjoy working under the sun and breathing fresh air. Biogas tanks are incorporated to collect organic food waste from the surrounding community, which is then converted into energy to power the offices and provide heating for the complex and even the nearby Jane Bell Hospital.

Figure 7. 'Park, Work and Play' Project by RMIT University Students: Minh Duc Vu, Sebastijan Karlusic & Yidan Xu, supervised by Ian Nazareth and Lisa Gargano

Moreover, the columns within the complex are designed to accommodate future expansion as the need for additional spaces arises with the population growth. This allows for the continual growth and integration of new elements into the car park/offices complex. Through these innovative approaches, the 'Park, Work and Play' project reinvents the traditional car park typology, creating an open and inclusive gathering place for the local community. By involving waste management initiatives and hosting events, the project gives back to its surroundings while fostering community engagement.

The public exhibition of design ideas played a crucial role in introducing the general public to the discourse of energy transition and its relationship with the built environment, by making complex concepts accessible, engaging, and relatable. Through visualisations, interaction, didactic models, data, and community-building, the projects and exhibition have a vital role in raising awareness and fostering a collective commitment to a more sustainable energy future.

REFLECTION

Architecture stubbornly resists change unlike cities, making it simultaneously robust and fragile. Despite architects presenting themselves as versatile public intellectuals, the profession remains focused on its outdated agency. Architecture is not a victim but an active protagonist. It used to play a significant role in shaping the built environment through its connection to materials, energy, and climate, but we have lost sight of this understanding. The construction practice is trapped in procurement models and financial anxieties, hindering sustainability and resilience. To unlock new

possibilities, we must rediscover this neglected reality and delve into the mysteries of architecture, materials, energy, and consumption to forge responsible configurations with the environment.

We face a circular predicament where solutions cannot be solely achieved through rational thought. Collective action is essential. To design for abundance, we must first understand design for depletion. How can we reimagine the Vitruvian concepts of firmness, commodity, and delight within the interaction of buildings and natural systems? What can we extrapolate for future practices involving materials and structures?[9] Is the traditional approach of building as a problem-solving endeavor now entirely obsolete? (And if so, how can we minimize construction?)

What if these ideas are not radical but rather fundamental and realistically applicable? Rather than pursuing revolution, our focus should be on the continuity and relationships between what we already understand distinctly.

Carbon, as an energy source and store, has influenced societal behaviors and cultural objects.[10] However, the cultural dynamics within complex systems are often overlooked when comprehending interdependent systems.[11] How does architecture, as a bridging practice, empower local communities and culture?

The transition away from carbon will be a gradual process involving scalable architectures and interventionist practices. The built environment becomes a flexible foundation for a modern energy ecosystem, where energy is extracted and utilized independently of a grid, and food is produced at a scale within urban blocks. At what stage does this transformation occur?

CONCLUSION

What if we abandon consistency and the familiar? We would encounter a paradigm that requires re-articulation and recalibration of spatial practices.[12] Space, type, form, and more become responsive and mutually influential. Space gains agency. The problem encompasses political, social, economic, technological, environmental, psychological, and cultural aspects.[13] As Keller Easterling argues, "It is not even the content of problems but rather their interplay that is most important."[14]

Perhaps this pushes architecture to genuinely embrace the limits of its accuracy, where inevitability becomes the only certainty. The stability of architectural reality within the energy paradigm faces challenges beyond market forces and structural considerations; it challenges the creative process as well.

Maintaining the status quo would mean operating from a position of power, perceiving risk and reward in a shamanic manner, and seeking mutual benefit. However, neither of these may be genuine nor relevant, despite the tempting allure of wholehearted commitment. Previous practices cannot dictate future behavior, favorability, or success.

NOTES

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OFF-SITE TECHNOLOGIES:
CAN PANELISED OFF-SITE CONSTRUCTION BE THE SOLUTION TO LONDON'S HOUSING CRISIS?

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INTRODUCTION

House prices in the UK have risen in the last ten years, yet house construction is at its lowest level since 1924. According to estimates, Britain will face a housing shortage of roughly a million homes by 2025 in a nation where up to 70% of adults are accustomed to owning their own homes.[1] The UK is known to have the highest rates of homeownership in Europe, but it is getting more difficult based on the lack of affordable housing as a result of low affordability due to low wages and high standard of living increases. This study aims to investigate how the use of panelised systems and materials can increase the current housing shortage. The housing industry is generally dominated by traditional methods of construction which has a limited range of products to resolve this housing crisis.

The findings suggest that the housing shortage in London is a crisis that stems from affordability/availability and subsequently suggests the adoption of Panelised Offsite Construction (OSC) as a smart and affordable solution to the problem. However, it is necessary to implement new policies that would effectively support, stimulate, and maintain housing growth. This outcome will be used to understand how best to implement modern methods of construction.

Problem Statement

The British government, through social housing, local councils, and private investors, has devoted a significant number of resources to resolving the London housing problem, but little progress has been made. Despite the recent uncertainties around COVID-19, the housing problem in London remains unsolved.[2] This problem will persist until traditional brick and block walls are replaced by panelised systems that are sustainable, innovative, eco-friendly, and environmentally friendly building technologies, as well as faster diffusion of construction innovations.[3] Uncertainty and complexity are generally intrinsic to construction ventures. This tends to be applied to house building and designing. House building has been recognised as a complex set of activities that may involve specialised actors as well as their onsite activities, which are particularly dependent on the weather conditions. Traditional house building generally includes complexity, which means uncertainty for the builders. Besides, there are major challenges that are faced by the builder's onsite.[4] As a result, many advocates

proposed a solution that shifts many onsite-based construction activities to a much-controlled offsite environment.[5]

The housing sector is generally dominated by traditional builders, who may provide a limited range of products to cater to the owner-occupation market and single-family homes. A wide range of discussions has been based on addressing the potential benefit of Offsite construction. There has been a general expectation that panelised offsite be extensively adapted. However, most construction companies do not want to adopt these new technologies. Offsite construction is generally regarded to be a much more expensive option because of the higher initial capital outlay, design, and carnage on transportation expenses. Offsite housing manufacturing tends to be an umbrella term for house building that relies upon the single components that are being manufactured in factories and then transported to a site to be finished and assembled there.[6]

The current housing crisis in the UK has led to the current housing crisis in London. The National Housing Federation (NHF) estimates that until 2030, the UK must construct between 250,000 and 300,000 additional dwellings per annum. Due to rising construction costs and a shortage of trained laborers, the sector is now only able to produce 180,000 homes annually which cannot meet the housing deficit. There is also a steady decline in the provision of social housing and research has proven that panelised construction might provide a cost-effective answer.[7]

Additional homes provided in the year ending March

Source: MHCLG · BBC
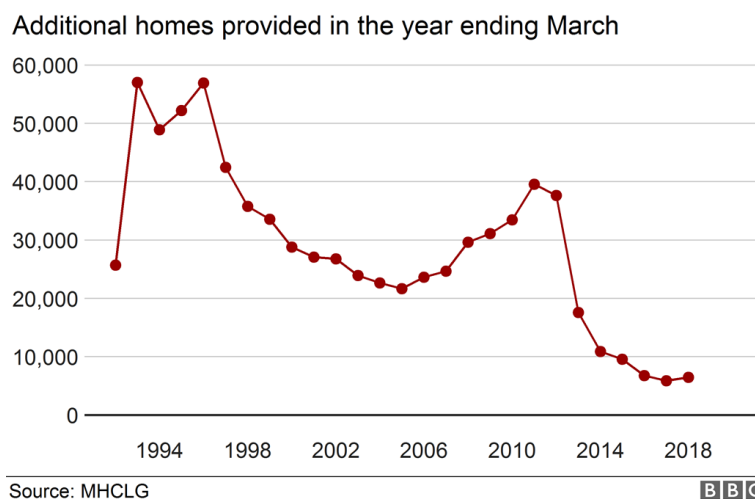
Figure 1. Fall in new Social housing across England

The construction sector contributes more than £105 billion to the UK economy and benefits more than 300,000 related companies in the country.[8] Due to the ongoing need for new construction and more affordable housing options, it is anticipated that modest home builders would use this opportunity to fund research and development for accessible building procurements. Compared to other industries, the construction industry in the UK lacks innovation. The automobile industry, mobile phone technological developments, and various other industries are suitable examples. Offsite construction deals with new building methods by moving the building construction practice from on-site into a well-ordered workplace.[9] Although OSC is still in the early stages of being used in underdeveloped nations, it has attracted considerable public interest due to its potential advantages in realising

improved project procurement. Numerous studies have compared the cost-effectiveness of OSC versus traditional building methods. Offsite manufacturing (OSM), according to the UK government, may effectively replace traditional building techniques. OSM and Modern Methods of Construction (MMC) have experienced some development in the construction sector because, it has been able to identify ways to boost productivity and reduce waste by borrowing knowledge from other sectors, such as industrial manufacturing.[10] Furthermore, the industry hasn't changed much from the traditional building processes, which have yearly sales of approximately 15 trillion USD, or around 6% of the world's GDP. OSC, OSM, and MMC are more cost-effective in the design and planning stages and can speed up the building process by up to 55%.[11]

OSM has demonstrated its capability in other nations, and specialised developers are now able to make huge, customised, luxury homes that can arrive on trailers at a cheaper cost and in a shorter amount of time. However, OSM is not acknowledged by small house builders in the UK. Until there is a significant shift from the old brick and block walls to a more adaptable, pleasant, sustainable, innovative, and environmentally friendly means of constructing, as well as a quicker diffusion of construction technologies, the traditional ways of building will persist. Even though social housing providers, the local government, and private investors heavily utilised their resources for this purpose, nothing was accomplished. Despite the recent Brexit uncertainty, London's housing crisis remains unaddressed. To address the housing crisis in London, this research is interested in the adoption and diffusion of innovative construction methods that make use of offsite technology, panelised/prefabrication, Modular, sustainability, robotics, and cost-effective construction methods.[12]

OVERVIEW OF OFF-SITE CONSTRUCTION
History of OSC
The end of World War I saw that the UK's construction sector was impacted by significant shortages of skilled workers and building materials both being diverted in the war effort. This resulted in an acute shortage of houses between 1918 and 1938, the use of steel-framed housing and other industrialised housing based upon traditional precast concrete was encouraged.[13] In addition, during that period, more than four million houses were developed yet only around (5%) had been constructed utilising the approaches of offsite construction. Furthermore, by the end of World War II UK had witnessed a new approach to the construction of new homes. The implication of offsite construction settings had been addressed to the prefabrication via political pressure to develop affordable quality houses. Although the banking and insurance industries have also been critical of OSC, there has been a recent shift towards huge investment in OSC. In contrast, the UK continues to be a global leader in the production of OSC. The commercial sector has successfully employed OSC for large-scale initiatives such as schools, hotels, hospitals, airports, and railway stations.[14]

The Construction Sector in the UK
Every country's economy is significantly influenced by the building sector. It has been discovered that this sector deals with a notable infrastructure that includes both public and private infrastructure. It produces £11 trillion in yearly income, or roughly 8% of the Gross Domestic Product (GDP), and 9% of employment positively affects over 300,000 UK construction subsidiary industries.[15] To replenish the level of those departing the country and recruiting fresh talent, is becoming more difficult. [16] Additionally, it has been recognised to have an impact on effective government policies needed to lower the unemployment rate and increase economic prospects in countries. Small businesses with little efficient coordination and/or collaboration dominate and split the offsite construction sector in London. Additionally, those who build the homes make the presumption that

previous attempts at offsite construction solutions have failed. Clients using offsite manufacturing methods discovered that most British manufacturers currently use cutting-edge production procedures in contemporary or highly automated facilities.

Advantages of OSC

Offsite construction advantages include a tendency to produce less noise, reduce waste, and cause inconvenience to nearby residents. Additionally, offsite construction enables low accident rates and great quality assurance. Moreover, urban regions where a rise in housing demand tends to occur are where the need for OSC adoption is most evident. For the UK government to achieve its social and economic aims and objectives, the construction sector is also essential to the UK economy. However, this industry must be promptly modernised to guarantee that the majority of chances are available.[17] Additionally, the method of starting offsite construction settings has significant advantages; yet recent studies have shown that just 7% of the construction in Britain is now being done this way. Offsite construction methods provide a wide range of potential advantages in terms of productivity, the environment, and Society. In some instances, it addresses more dependable and speedier delivery owing to the construction of new homes, which tends to be 30% more quickly with associated costs that are around 25% cheaper. In addition, the venture expenditures associated with the manufacture of the structures can be reduced by around 50% thanks to offsite construction. Furthermore, the offsite construction environments improved worker's safety since they eliminated the need to work at height and/or underground.[18]

Disadvantages of OSC

Although, offsite construction has several benefits for a developer, it is mostly used for large-scale constructions in Britain. Offsite methods are discouraged by the UK planning system because it is perceived issue is as pervasive as CRL claims, it probably affects those in charge of granting planning permissions as well.[19] As most UK towns are filled with Victorian and Georgian Terraces, OSC are inevitably looked down upon by a planning system that emphasizes uniform appearance and protected vistas. Small construction companies lack the funds to invest in factories. Offsite construction has mostly been left to the major developers who can afford to keep their factories active since these enterprises lack the funds to create a factory or industry the regular enough work to be certain they will keep it busy enough to pay for its overheads. Also, not every location is appropriate because most sites available are small derelict pocket sites within the city centre which makes it impossible to adopt offsite construction. Other disadvantages include the following:

• To produce a high-quality outcome extremely effective planning and design processes are needed

• It has limited or restricted customization

• It calls for knowledgeable workers and cutting-edge production technologies

• No viable supply chain and a sustainable business model

TYPES OF OFFSITE CONSTRUCTION
Volumetric/Modular Systems

Buildings that are partially or entirely built off the site of construction and then move to the location using special-purpose vehicles are referred to as volumetric/ modular systems. However, certain minor finishing tasks are all managed onsite. The different building components are put together in modules, however the size of the modules or building components is limited because of the risk

involved in moving them to the construction site. Modular homes are built almost entirely in a factory. The house is constructed in separate box-like modules attached to walls, floor, ceiling, wiring, plumbing, and interior fixtures.[20]

Panelised offsite construction

The production of flat panel units in the shape of walls, floors, and roof tiles that may be utilised to create the whole shell of the structure is a component of Panelised offsite construction. Another name for these structural flooring and roofing modules is cassettes. After being produced, the units are brought to the construction site and assembled into a 3-dimensional structure. These panel units are built in a factory and shipped to the location where they are assembled into a three-dimensional structure to fit into an already on-site constructed structure. Insulated panels light gauge steel, infill walls, or light gauge still may be used to construct the produced structural modules.[21]

Hybrid offsite construction

Using both Panelised volumetric construction methods, single structures are built using hybrid construction. This construction is also known as semi-volumetric as a result. Mostly, parts like the kitchen, bathroom, and bedroom, are constructed as volumetric construction, and the remaining part of the dwelling is constructed using panels. This enables the whole construction process to be completed offsite and reduces the amount of time needed for onsite installation which has services embedded in it.[22]

Why Panelised Offsite Construction

The two most commonly utilised offsite construction techniques are 2D panelised and 3D volumetric modular methods. Panelised construction refers to the construction of individual walls and floors at offsite facilities before being assembled onsite. Volumetric construction refers to the construction of full units or rooms to a "finish" in offsite factories and craned into position on-site.[23] Panelised systems have a variety of advantages for developers and builders, which has resulted in a wide-scale adoption.

Their overall weight is low and they can be easily stacked for transport, so you can fit multiple rooms or units on a single lorry, resulting in very few lorry loads to and from the site. In a scenario where there is a need to change design solutions during a building program, it is much cheaper and easier to make them when working with individual panels, giving total cost control to the developer. Panelised systems also can be developed as factory-assembled wall and floor components and pre-insulated external wall systems, it quickly erects these components on-site to produce a shell that weathers quickly.[24] The building is then finished using manufacturing techniques in a real design for manufacture and assembly (DfMA) procedure. This will result in a significant shift in the way construction operations are carried out because of the accuracy with which the system is planned, produced, and put together on-site using BIM.[25] The role of logistics in panelised offsite construction implies that finished sections of buildings are delivered onsite in comparison to the delivery of materials, plants, and equipment in onsite construction. Panelised systems are much easier to transport than volumetric systems due to their sizes. For example, steel frame elements for high-rise or infrastructural projects can have large lengths whereas volumetric systems tend to have large widths. Another issue to consider is offsite logistics and regulation difference between standard and abnormal loads and the need for careful planning of the transportation routes which can be difficult.[26] Logistics

in offsite construction can bring several benefits including a reduction of deliveries to the site, better time management, and alternative transportation methods.

All other common advantages that volumetric systems provide are associated with panelised systems. One of the important advantages is they are constructed in a factory-controlled atmosphere and their manufacturing is unaffected by the weather. This implies that the building's interior finishes fit out, and services have already been installed, leaving just external facades, roofing and service connection, and commissioning to be finished onsite.[27.]

Case study: Portland's Place, East Village Stratford London

Portland's Place, East Village Stratford London is a high-rise residential structure that was completed in 2022. The two towers, one with 26 stories and the other with 31 stories. It provides 524 flats with 1 to 4 bedrooms and studio flats which are for private rental. The construction work of the project started on site in August 2019 with a Gross floor area of 57,090 m² and was completed in December 2022. MACE completed the project by developing a particular system known as the "jump factory" or, as MACE refers to it, the High Rise Solution (HRS) for the panelised method that was utilised for the construction of the building. One of the particularly important characteristics of this strategy is that the perimeter floor units are supplied with the facade attached, anchored to the bottom, and supported by temporary props. In this case study one of the advantages this solution offered is that it can be modified to an architectural design rather than forcing the design to be based on the original concept. There is room for alterations and changes in the design models. This project provides a reduction of transport logistics by 40% and a reduction of waste by 75% and overall delivers a lighter structural design.[28] This project was an indoor construction site that benefitted from a reduction of construction noise, lower safety risk, and reduction of environmental delays. This technique also ensures that the subcontractors embed critical measures in eradicating defects, improving the time of project delivery, saving costs for clients, and increasing productivity. Building the towers in enclosed protection ensures that weather does not affect the delivery times of the project which reduces delays and cost overruns.

Figure 2. Portland's Place London – Panelised Method: The Jumping Factory, 2020

Results of Case Study

Design

This specific project was able to achieve any architectural concept as efficiently as possible for off-site production. Based on meeting the set of requirements set by the employer which was met or exceeded. The design and construction team where able to also meet all performance standards or comply with building regulations.

Manufacturing

A Panelised off-site production facility needs to adhere to health and safety alongside high production quality assurance which should be consistent and up to standards. Quality control measures are followed and regular inspections are finished earlier in the production process.

Logistics

Due to eliminating the need to supply materials on-site finished sections of the buildings are delivered which increases the effectiveness of site delivery by cutting down on vehicle movements by 40%, and carbon footprint which will be beneficial for the environment and have a less negative impact on nearby communities.

Site Assembly

The process of bringing the components together and assembling them on-site is far quicker than using conventional techniques. A 25% improvement in the program will lower funding costs and open up early earning potential for developers. This automation approach reduces the need for having tradesperson onsite but rather key professionals are used in the site assembling of the buildings.

Time and Cost efficiency

It is paramount to note that the overall budget placed on the project was achieved which translates into a more cost-effective project. The reason for an overall increase in the price of properties is due to the cost of labour and material. Panelised methods attend to the cost of labour as housing is built from the factory which eliminates bad workmanship, illness, and unavailability of workers.

Finished Product

The entire project was consistently delivered to a high standard. This creates the option to maximise value in new areas, such as optimising floor-to-wall ratios and net-to-gross areas, as well as constructing lighter structures that can reduce foundation loadings and potentially achieve extra stories within the same planning environment.

CONCLUSION AND RECOMMENDATIONS

The current housing crisis in the UK especially in London boroughs will continue to plague the environment unless there is an adoption of new building techniques which includes panelised, modular, sustainable, robotic, and cost-efficient construction methods to address the housing crisis. Studies have connected OSC to several benefits, including reduced assembly periods, reduced costs, improved worker safety, higher quality and quality control, waste minimisation, improved site management, and better quality and affordability.[29] Although offsite construction has been successfully adopted within the commercial and industrial sectors there are opportunities to adopt it within the residential sector especially with the development of modern Panelised offsite technologies.

The Jump Factory is a technological innovation that is the on-site factory and an incredible creation of Mace, which is a crucial add-on that plays an important role in this particular case study. This remarkable invention of Mace is what enables the construction team to operate constantly regardless of the weather conditions, particularly in windy scenarios. It protects the entire working surface of the platform, which has the additional benefit of reducing the dangers associated with working outdoors by shielding workers from the elements and making it less likely that they would be injured in an accident. This advantage is in addition to the independence from alterations in the climate. The case study shows that panelised construction is one of the foremost methods that can be employed in tackling the housing shortage in London and the UK.

In summary, the adoption of Panelised offsite construction can be adopted through following the recommendations:

• The construction industry needs government incentives to promote sustainable off-site Construction to enhance adequate housing provision

• Providing training for construction employees and employers

• A robust housing grant for Londoners to purchase a Panelised OSC house.

• Awards/incentives for the construction sector to ensure the proper launch of Panelised OSC production.

• Tendering OSC-friendly procurement policies to promote panelised OSC

• Panelised construction has attracted considerable attention owing to its advantages over the volumetric construction method regarding design flexibility and transportation requirements.

• Sufficient financing for Research and Development, tax incentives for adaptors, and council tax rebates for end-users

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ASSESSING THE LEVEL OF LIVABLITY IN COMMERCIAL STREETS IN THE GULF: A MIXED METHODOLOGY APPLIED ON THE STREETS OF MUSCAT

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INTRODUCTION

The concept of livability has gained popularity and has been used in practice and planning theory for the last 50 years.[1] Nevertheless, the term is not well defined in the field of urban studies. Livability as such reflects the quality of living and its impact on community and people wellbeing.[2] Jan Gehl studied people in architecture to understand how walkable, social environments create livable cities.[3] He developed criteria to evaluate the livability of spaces and guidelines for the Design and improvement the livability of public realm in cities. Pedestrianizing neighborhoods is fundamental in order to achieve livable, walkable and healthier outdoor environment, because it positively impacts community life and people's socialization.[4] However, "pedestrianization" alone is not sufficient to create a vibrant and livable street or neighborhood. Other aspects and features are required in such spaces.

The aim of the present study is to investigate the level of livability in commercial streets of Muscat, and define the important design aspects that affect it, and their impact on community life in such neighborhoods. Two case studies were selected for this purpose. The methodological approach was of qualitative and quantitative nature. A comprehensive literature review was undertaken to understand the concept and tools that helped in the study of livable streets in neighborhoods. Questionnaires and behavioral mapping were also conducted to identify the patterns of people's activities in the selected streets. The data analysis revealed that sense of place, aesthetic appeal, activities and pedestrian friendly streets attract people and promote the use of space, thus enhancing the level of livability in the street. The study contributed also in contextualizing Gehl's set of criteria and indicators to assess the level of livability in commercial streets in Muscat. It is suggested that such criteria could be generalized to other cities of the Gulf and in similar geo-cultural contexts.

RESEARCH OBJECTIVES

The main purpose of this study is to examine the validity of the urban quality criteria and their sub-indicators based on the themes set by Jan Gehl, and their effect on improving the livability of commercial streets of Muscat. The research's objectives are underlined by the following questions:

1- What is the level of livability in the neighborhood commercial streets of Muscat and to which extent does it meet the inhabitants' expectations?

2- To which extent does reformulating the "Souq character" within neighborhood commercial streets increase their livability standard?

LITERATURE REVIEW

The literature in urban studies is focused on the importance of the public area as both a function and a necessity for the experience of community life and social interaction.[5] During the past years, urbanized areas have witnessed a minimal development in publicly accessible open spaces such as public park systems and green spaces. Cities worldwide are facing significant challenges in meeting the growing demand for such spaces.[6] There is an increasing need for pedestrian-oriented streets, squares, shopping areas, and other types of open public spaces. Streets are often considered the most prominent form of the public realm, and they make up a considerable part of the open public space that can be found in metropolitan environments.[7] Streets are essential to people's daily lives because of the social and recreational activities that take place within them. They are designed to accommodate these demands and have a positive effect on the economic development and people's physical and social wellbeing, in addition to encouraging a sense of community.[8] Several researchers argue that the street should be seen as a social place instead of just a transportation route.[9] It is evident that certain streets are livelier than others, and thus, not every street has the capacity to support the same quality of socialization and livability.

The term livability was first used in the 1950s,[10] and was then brought to urban designers and planners in the book of Appleyard:[11] "*Livable streets*", which was first published in 1980. In this book, Appleyard related the concept of livability with transportation and streetscape, which was the basis of his study on streets. In 2005, the American Association of Retired Persons AARP gave their definition of livability that is almost the same today: "*A livable community is one that has affordable and appropriate housing, supportive community features and services, and adequate mobility options, which together facilitate personal independence and the engagement of residents in civic and social life*"[12]

The concept of livability addresses both the human and place. From a human perspective, it relates to the idea of sustainability for a person need. According to Jomehpour, livability can be seen as the sum of socio-cultural and socio-physical factors that can help in improving the living standards in any space.[13] On the other hand, livability of a place, refers to the level of its vitality. According to Al Saeed&Furlan, these could be achieved through different measures such as: (1) pedestrian- oriented built environment, which is an outcome of a mixed used development; (2) outdoor spaces supporting healthy activities which are attractive and safe (3) attractiveness across age categories; and, (4) providing an integrated multimodal transportation system[14] (Figure 1).

To define a livable city, Lynch specifies five dimensions of performance which are better known as the five Lynchian dimensions (sense, fit, vitality, access and control)[15]. A sixth dimension (viability) is later on added by Balsas.[16]
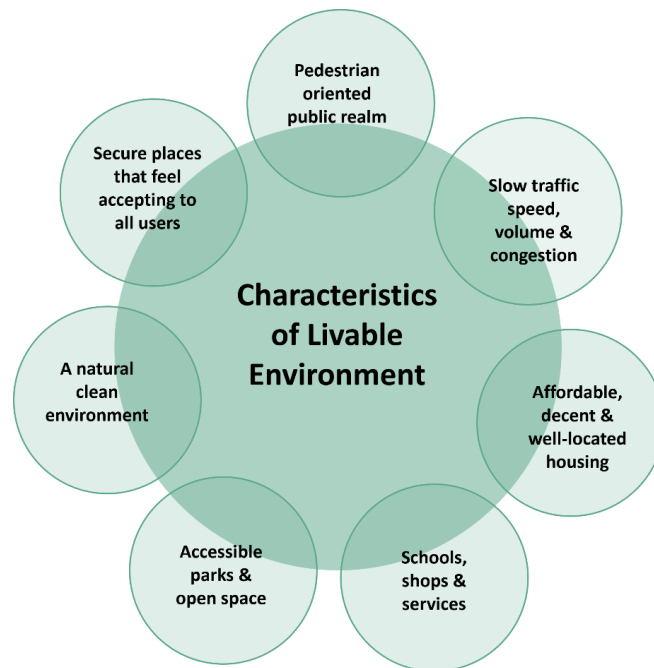
Figure 1: Livable environment Characteristics[17]

The level of livability in cities and places is mainly measured through indicators, which serve to describe a complex economic, social or physical reality. These indicators are used to assess the standard of livability in cities and urbanized regions[18] as well as the well-being of a communities.[19] Moreover, indicators can be used as a tool for, conciliation, analysis and decision making among different groups of actors, for the improvement of a given condition.

In order to develop livability indicators, Mitchell suggested a methodology composed of four steps: 1) defining the problem, variables, and principles, 2) isolate and select problems, 3) construct the indicators and finally evaluation of data.[20] For the same purpose, Balsas recommended the following steps: 1) involve others for providing information and simplify the indicators, 2) begin with the baseline data, and 3) satisfy and relate to each stakeholder.[21] Additionally, Mullin&Kotval identified other criteria to assess livability: impact and relevance, simplicity and clarity, validity and availability, the ability to reflect on trends and comprehensiveness.[22]

Livability level is still difficult to measure.[23] It is the fulfilment of needs and preferences to the expectations of individuals that leads to higher livability level. This means that even the measurable and physical environment play a different role in every individual's life, based on their varying preferences and needs. Therefore, an overall assessment by applying general weights to each livability factor is not recommended because not pertinent.[24] Appleyard who studied the effect of streets' activities and layouts on livability in urban areas, points out that those who live near high traffic streets have a lower perception of livability.[25] Therefore, shifting neighborhoods away from the streets of heavy traffic and main arterials would be a solution to reach the desired livability.

Jan Gehl's visionary work has helped cities adapt their space to their people instead to traffic. His method was based on the idea that cities were meant for people and thus the approach of thinking towards urban design should take into consideration the human factor. In his published work, Gehl used the concept of human scale, which focuses on objectively describing a good urban environmental quality based on the perception of scale, distances, speed and direction.[26] As such, the condition of having a "good" urban environment is essential for spending time in a public space. Here, "good" signifies an urban environment that incorporates liveliness, safety and aesthetics among other traits.

In a study on reclaiming streets and making them pedestrianized and more livable in downtown Cairo, Basil, Wahba, Kandil, & Fadda investigated "Al shawarbi Commercial Street".[27] They adopted a theoretical framework based on the suggestion of prominent urban planners and theorists in the field.[28] Four main aspects were considered to transfer the street into pedestrian friendly commercial area. These were social, physical, economic and environment, with each of the aspects having key design concepts along with indicators for each one of them, as shown in table1. The study concluded that a successful approach to pedestrianizing the street, should consider the aspects of sociability and livability, accessibility, use, design, and comfort. This study's results were confirmed by recent research that investigated the streets in Oman by Benkari & Sallam,[29] and Al-Maimani, Salama, & Fadli.[30] These studies revealed the need for more commercial activities, such as restaurants and attraction points that encourage socializing, in order to satisfy the pedestrian needs and make them spend longer time in such streets.

Theorist/Urban planner	Book/Article/Report	Urban Qualities of Successful Street as a Space/Pedestrian Street	Physical	Social	Economical	Environmental
J. JACOBS	THE DEATH AND LIFE OF GREAT AMERICAN CITIES BOOK (1961)	Continued Uses & Activities		*	*	
		Continuity	*			
		Contract	*		*	
		Human Scale	*			
		Sense of Place		*		
		Child Use		*		
		Safety		*		
WHYTE	THE SOCIAL LIFE OF SMALL URBAN SPACES, BOOK (1980)	Visual Quality	*			
		Access	*			
		Sit-able Places	*			
A. JACOBS	Great streets (1983). *Access Magazine*, *1*(3), 23–27	Mixed Uses		*	*	
		Comfort	*	*		*
		Diversity		*	*	
		Livability		*		
		Safety		*		
		Human Scale	*			
		Designed Buildings	*			
		Adequate Sunlight				*
		Trees	*			*
		Cleanliness	*			*
PPS	WHAT MAKES A SUCCESSFUL PLACE, ARTICLE (2009)	Access & Linkage	*			
		Sociability		*		
		Comfort & Image	*	*		*
		Activity & Uses		*	*	
J. GEHL	CITIES FOR PEOPLE BOOK (2010)	Connection to Transit	*			
		Safety		*		
		Places to Sit	*			
		Attractive Sights	*			
		Diversity		*	*	
		Social Interaction		*		
MEHTA	THE STREET: A QUINTESSENTIAL SOCIAL PUBLIC SPACE, BOOK (2013)	Sense of Belonging		*		
		Usefulness		*		
		Pleasure		*		
		Comfort	*	*		*
		Safety		*		
		Accessibility	*			
VECTOR DOVER	STREET DESIGN, BOOK (2014)	Shape	*			
		Comfort	*	*		*
		Safety		*		
		Memory/Image	*	*		
		Connectivity	*			

Table 1. The framework adopted in the conception of street as space/street pedestrianizing from the perspective of different theorists/urban planners[31]

METHODOLOGY

Based on the research's aim and questions, a multi-layered methodology was designed and implemented following different stages. In the present stage, and after a thorough literature review about the subject, two case studies were selected, and two methods (Questionnaires and Behavioral Mapping) were applied. The methodological process of this research is illustrated in Figure 2:
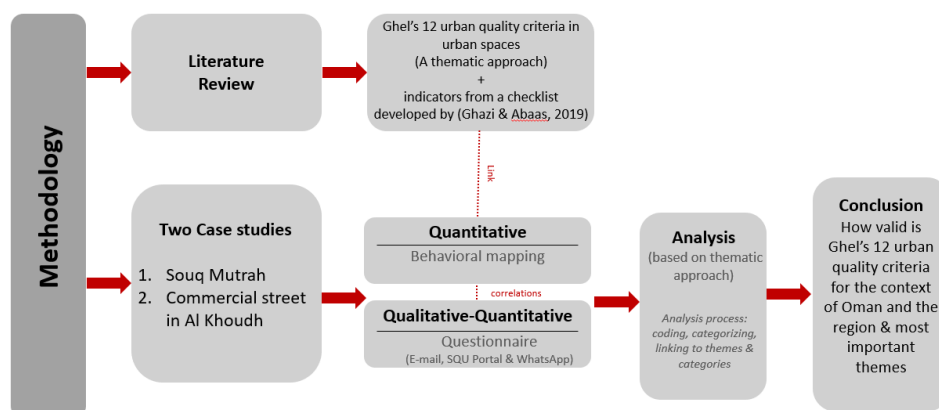
Figure 2. Methodological process (By the Authors)

Case studies

The case studies were first chosen in reason of their commercial activity, which serves the aim of the research. Secondly, each site has its unique character. The first case study is Souq Mutrah, located in the old Muscat area. It is an old Souq (traditional commercial street network) and the most famous one in the country. For its historic value and cultural character, it is visited by people from various nationality and a favorite amongst tourists and locals.[32] Additionally, its commercial activities differ from the conventional retail streets (Figure 3).

The second case study is a commercial street in Al Khoudh area, opposite to Mazoon Street (Figure 5). The purpose of its selection is due to the fact that it is a type of retail street that is commonly found anywhere throughout the city of Muscat. This street is becoming popular amongst students and youth, as it is located a few Kilometers away from Sultan Qaboos University. Consequently, the residential neighborhood boarding this street had its land-use partially and almost spontaneously changed into commercial activities. Thus, it is interesting to understand the livability aspects in these "spontaneous" retail streets within such neighborhoods.

Figure 3. Selected Case Studies (By the Authors)

Questionnaire

The questionnaire addressed the perceived aspects of livability in the selected case studies for this research. The online questionnaire was open to collect responses for about 5 months (fall semester 2021). The sampling type was a non-probability convenience sampling,[33] and the sample size was of 113 responses. 37.6% of respondents were males and 62.4% were females. 80.2% of respondents were Omanis and the highest number of responses (46.5%) were received from the age group between 26-35 years old. Most of the responses were directly processed through google platform. A few answers, however, needed further analysis through specific categorization and coding following the urban quality criteria developed by the authors based on Gehl's initial criteria. Based on their recurrence frequency in the participants' responses, new criteria were added. These new criteria are "*The opportunity to experience the cultural characteristics of space*" and "*Facilities*". For the same reason, an additional theme "*Amenities, complimentary services & convenient design*" was added to the themes developed by of Gehl. The percentages under each theme, based on the indicator's coding count in the responses, were then taken and analyzed to see which themes are the most important based on the received responses (Figure 4).
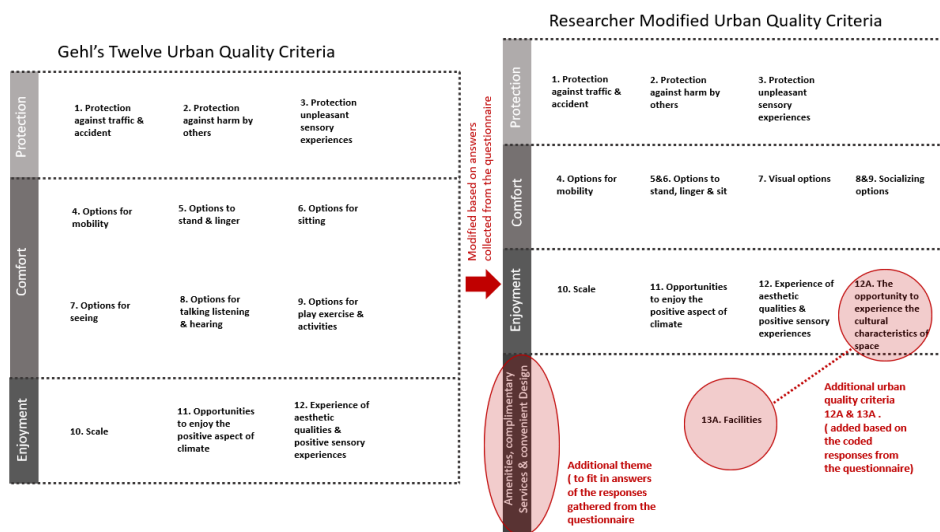
Figure 4. Gehl's twelve urban quality criteria and the suggested modified urban quality criteria to fit the case of Oman (By the Authors)

Behavioral Mapping

Behavioral mapping is a method used to capture and understand people's behavior within their urban environment.[34] People's behavior is recorded periodically based on a given time interval. The collected data serves to form "behavioral maps" showing the people's numbers and/or types of activities within a given site. For the present research, a Behavioral Mapping was conducted in both selected sites, on two consecutive days: Saturday (20th of November 2021) and Sunday (21st of November 2021). Two points in each one of the sites were identified to perform the counting of people. Four volunteers with architectural and urban planning background took part in this on-site counting, following a protocol developed by the researchers and under their guidance. The counting was performed for 10 minutes to record the number of static and dynamic people. It took place in specific points in the site and during three-time intervals: in the morning (9am-11am), in the afternoon (12pm-15pm) and in the evening (17pm-21pm).

In the first site: Souq Mutrah, points 2 & 4 were selected as showed in Figure 5. Point (2) is the main entrance to the Souq from the northern side, which faces the touristic Port of Sultan Qaboos. Point (4) is located at the end of the Souq, and leads to an open plaza surrounded by some commercial/residential buildings.
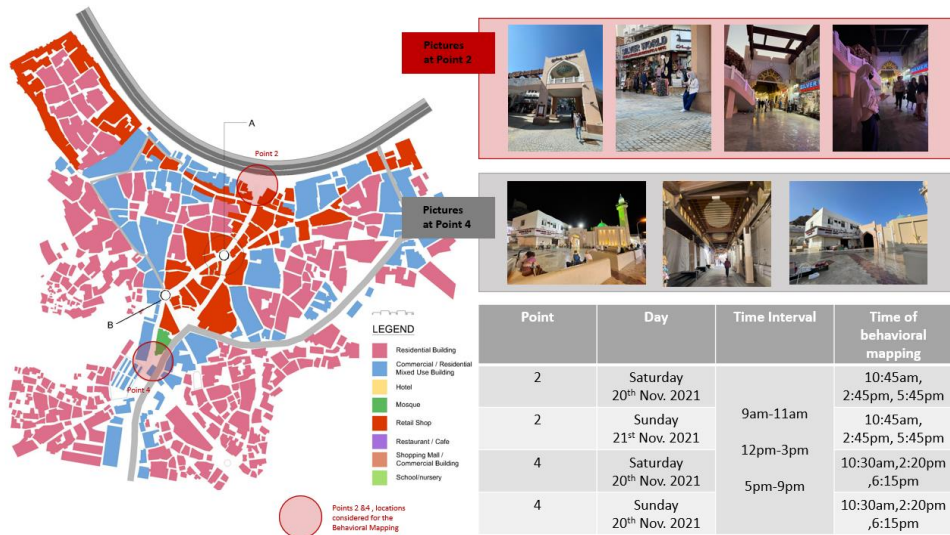
Figure 5. Souq Mutrah map showing points, time & day selected to perform the Behavioral Mapping (By the Authors)

As for Al Khoudh site, the chosen points were 1 & 2 and 3 & 4 as showed in (Figure 6). The numbers recorded for the two sites were then analyzed and compared. Behavioral Maps showing the number and behavior of people in each of the selected points in these sites were generated (Figures 7-10).

Figure 6. The commercial street in Al Khoudh map, showing points, day and time selected to perform the behavioral mapping (By the Authors)

RESULTS & DISCUSSION

From the responses to the questionnaire, it appears that the level of livability in the commercial streets of Muscat does not meet the expectations. There seems to be a lack in the themes of "comfort" and "enjoyment" in these streets. However, the "Protection" theme meets people's expectations. Hence, "security and safety" is considered high in the region.

People seek to have a higher comfort level in streets that are animated and lively. 57.24% of the respondents agree that a higher comfort level is needed for commercial streets to be considered livable. Furthermore, according to the responses, the "enjoyment" factor is also important to make

them revisit such streets. For instance, 63.54% of the respondents' revisit Mutrah Souq, because they find it an enjoyable experience, and 39.14% see that this factor is lacking in Al Khoud Commercial Street. Therefore, these two themes: "comfort" and "enjoyment", are important to be met in order to increase the livability standard of such streets to meet people's expectations.

The behavioral mappings were analyzed to see any correlations with the results of the questionnaire. The averages of people count for each of the given sites were taken at a weekend and a weekday at the selected points where the behavioral mapping was performed as shown in figures (7-10).
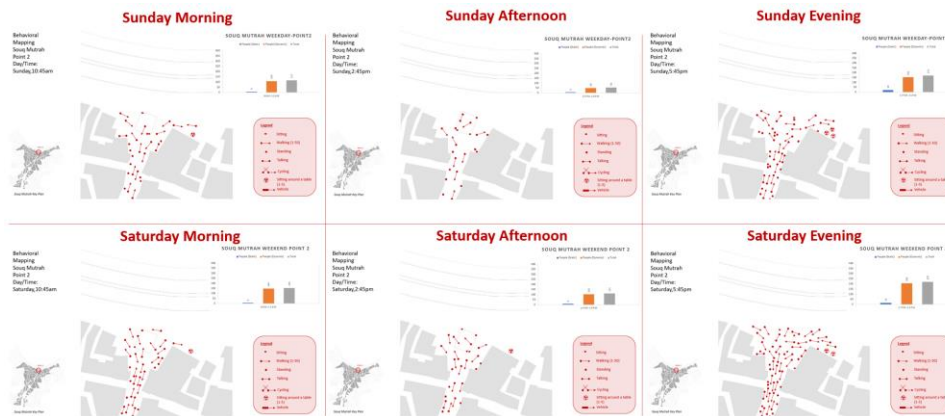
Figure 7. Souq Mutrah at Point 2, behavioral maps at 3 different time intervals during a weekday & a weekend (By the Authors)
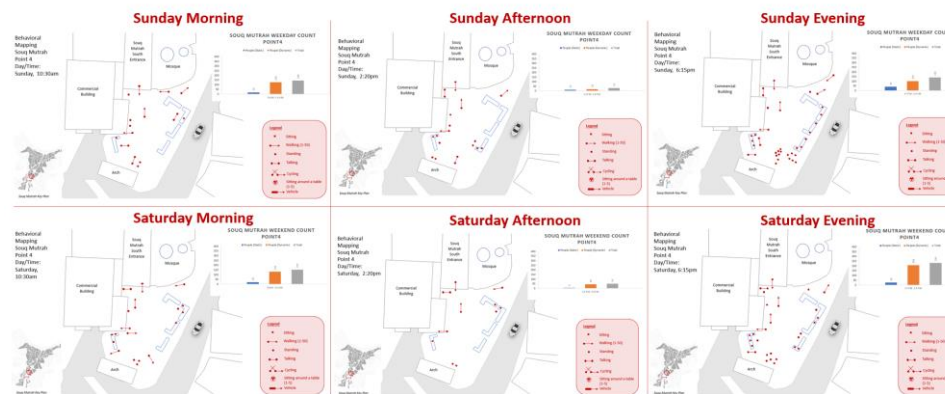
Figure 8. Souq Mutrah at Point 4, behavioral maps at 3 different time intervals during a weekday & a weekend (By the Authors)

The above figures show that the number of people in a weekend is higher when compared with the weekday count. Additionally, the time interval between 17pm-21pm showed the highest count of people in both weekday and weekend when compared with the other given time intervals. It is closely followed by the morning. Comparing these results with the responses gathered from the questionnaire revealed that the majority (41.1%) visited Souq Mutrah during the evening. Therefore, the results of the behavioral mapping and questionnaire correlate for the evening period visit of the Souq. However, the responses gathered for the morning and afternoon period did not correlate with the behavioral mapping results. 28.4% of the respondents prefer to visit Mutrah Souq in the daytime and 30.5% during the afternoon. While the results of the peoples count showed that, the number of people in the morning is higher than the afternoon. This difference could be due to the fact that the majority of participants in the questionnaire are working people, and the visits to the Souq is more convenient for them during the afternoon and evening time. The fact that the questionnaire did not include tourists

might also have a role in this difference between the questionnaire results and the behavioral mapping.

Figure 9. Al Khoudh Site between Points 1&2, behavioral maps at three different time intervals during a weekday & a weekend (By the Authors)
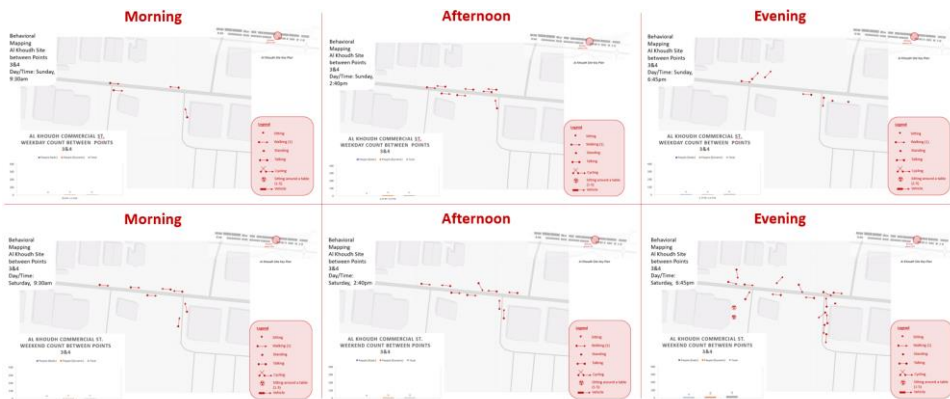
Figure 10. Al Khoudh Site between Points 3&4, behavioral maps at three different time intervals during a weekday & a weekend (By the Authors)

The behavioral mapping of Al Khoudh site in a weekend and a weekday seen to be similar to some extent. The morning and late afternoon periods in both days showed a low count of people when compared with the evening period (Figures 9, 10). This could be due to the fact that this street is mostly used by vehicles rather than pedestrians. It is worth mentioning that the behavioral mapping did not consider the number of car users, and focused only on the number of people in static and dynamic status. The results of the behavioral mapping was correlated with the results of questionnaire. In both weekday and weekend counts, the evening count was the highest. The weekend count showed 15 people more than the weekday. When asked about the time of the day in which they go to this site, 42.6% of the respondents chose the evening. This correlates with the results of the people count (Figures 9, 10). Furthermore, the results from the questionnaire showed that 29.4% of the respondents visited this street in the morning, and 27.9% in the afternoon. This result correlates with the weekend average count and a little less with the weekday count result, where the number of people was slightly higher in the afternoon when compared with their number in the morning count.

To sum it up, the counts done for the two sites showed that the number of people on weekends is higher than their number in the weekdays. In Al Khoudh site, people's count showed a minor difference only. When looking at the site of Souq Mutrah, which is a pedestrian street, the difference

is obvious. It was observed that on weekday Souq Mutrah had the highest count of people in all of the given time intervals during the day. The maximum number of people count was noted in the evening time interval, which had an average count of 313 people. The afternoon period had the lowest count of people when compared to the morning and evening times. Additionally, the morning time interval showed a high count of people when compared with the counts of Al Khoudh site for the same time interval. In contrast, the lowest number of people count was observed in Al Khoudh site in the morning, with an average of 14 people, and the highest was in the evening with an average count of 50 people (Table 2).

Time interval/Area	Weekday			Weekend		
	9am-11am	12pm-15pm	17pm-21pm	9am-11am	12pm-15pm	17pm-21pm
Mutrah	261	85	313	307	161	453
Al Khoudh	14	27	50	23	21	65
High count of people						
Low count of people						

Table 2. Summary of the behavioral mapping of the two case studies showing the average counts of people (By the Authors)

CONCLUSION

The present study investigated the level of livability in two selected commercial streets in Muscat, in order to define the important design aspects that affect it, and exploretheir impact on community life in such neighborhoods. Gehl's twelve quality criteria, which were grouped under three main themes "protection", "comfort" and "enjoyment", were considered, with a few additions, as the basis in evaluating the livability level in the two selected case studies. The responses collected from the questionnaire revealed another theme "amenities, complimentary services & convenient design" to be important to consider when valuating livability. It was added to Gehl's in order to fit certain indicators to create a valid tool specific to the case of Oman and the Gulf region. A detailed behavioral mapping was performed in both sites at different days and in several time intervals. This method was coupled with a comprehensive questionnaire administered online to a randomly selected population.

The behavioral mapping showed that people's presence in the studied streets is higher in weekends when compared with the weekdays. The questionnaire results revealed also that city streets that are comfortable to use are perceived as being safe and secure. Additionally, being properly planned and designed, well maintained, clean, with pedestrian paths and having amenities such as: parks, gardens, landscaped streets, activity & social spots, cafes, playgrounds, cycling lanes, at a walkable distance, will positively impact the community life in such streets an make neighborhood livable. The questionnaire results and behavioral maps validated the urban quality themes and criteria developed from Gehl's work.

From the analyzed responses collected through the questionnaire, it can be concluded that the themes of "comfort" and "enjoyment" are the two most important themes for people in Oman. However, "Protection" is not as important as the first two themes. This is probably because of the high level of security and safety in Oman, which is known as a peaceful heaven for visitors and residents.

Furthermore, the "comfort" and "enjoyment" themes need more attention to make commercial streets livelier in Oman. Under the comfort theme the urban quality criteria of "mobility", "options to stand, linger& sit", and "socializing options" need to be further considered when designing such streets. Additionally, in the "enjoyment" theme, the urban quality criteria of "experience of aesthetic qualities" and "positive sensory experiences" should be better considered, in order to make the

commercial streets livable. In addition, to create a sense of place as to the case of Souq Mutrah, the opportunity to "explore the cultural characteristics of space" is an important urban quality criterion to consider in the design of commercial streets as it consolidates livability and provides more attraction for visitors to revisit the place. Therefore, it can be argued that by reformulating the Souq cultural characteristics into the modern commercial street designs, livability could be enhanced. More specifically, under the "comfort" theme five main indicators need to be satisfied in a commercial street for it to be qualified as being lively: 1) having pedestrian paths, 2) Presence of street furniture, 3) having cafes and shops, 4) allow people to gather and engage and 5) having different activities. Additionally, the most important indicators to be present under the "enjoyment" theme are: 1) being an architecturally appealing place and 2) having an appealing landscape.

Finally, the thematic analysis done for the two case studies concluded that the criteria that are set by Gehl are broad and should be more specific by using criteria and indicators that fit the cultural context of the studied country, in our case Oman. Overall, Gehl's twelve quality criteria are valid for public spaces in general but to consider commercial streets specifically, his themes and criteria need to be enhanced and shaped to address the needs of lively commercial streets in the Gulf region.

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WALKABILITY IN PLANNING PROXIMITY:
A CRITICAL REVIEW OF THE 15-MINUTE CITY

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INTRODUCTION

The 15-minute city has taken a central role in the urban planning field, especially in a post-pandemic context. The concept coined by Carlos Moreno[1] assumes the principle of proximity to essential daily activities (e.g., work, food, healthcare, education, culture, sports, leisure, shops and services of proximity), within a walking or cycling time not much longer than 15 minutes.

However, the literature points to the conceptual basis of the 15-Minute City model in postmodernist debates about New Urbanism, namely the Pedestrian-friendly Neighborhoods.[2] Concomitantly, Walkability implicitly arises dissolved in theoretical discussions that bring to light the Walking and Transit Urban Fabrics in contrast with car-oriented planning.[3]

This paper seeks to review the concept of the 15-minute City, proposing a critical reflection about the emphasis on the dimension of Time - "15 minutes"- as a discourse for planning strategy. The critique aims to bring the social dimension of Proximity back to debate,[4] reinforcing Walkability as an input for a context-sensitive Planning approach.[5]

This critique questions the focus on the quantitative approach of Proximity through rational time-distance by foot and bicycle. Then, the qualitative approach of Proximity emerges, considering social and plural dimensions of urban rhythms that impact people's decisions as regards walking and cycling for daily activities. The review is developed through the following topics:(1) the background of the 15-minute City; (2) The Discourse of the 15-Minute City: The value of Time as a commodity knowledge for planning; (3) Walkability as an input to the City of Proximity under a context-sensitive planning approach.

THE 15-MINUTE CITY BACKGROUND

The recent literature acknowledges that conceptual principles related to the 15-Minute City had been under discussion since the postmodernist critique. Reflections show Jane Jacobs[6] activism as a precursor of Community Design,[7] proposing to rescue traditional values such as diversity of function and livability.

Similarly, Jan Gehl proposed the concept of a City for People, highlighting "life between the buildings" in the role of public space free of cars.[8] Approaches to the quality of urban design[9] also stand out from the relationship between people perception and aspects of the urban landscape that favors walking, and collective fruition of public spaces.

These authors fostered the postmodern theoretical debate questioning car-based Urbanism, disregarding identity components that gather people. Those concerns react to the logic of car-oriented urban planning, which unmolds the city's human scale, both spatially and politically. Henri Lefèbvre further reinforces such critique by pointing out to urban planning practices disconnected from community participation and oblivious to significant factors.[10] Françoise Choay also proposes reflections on missing "Civitas" value in contemporary urban space production.[11]

However, the literature shows 15-minute City's foundation in the postmodern critique and defines as its principles – Proximity, Diversity (land use and people), Density, and Ubiquity (accessibility and inclusion to all social groups)[12] – many aspects in common with postmodern debates.[13] However, despite mentioning Proximity as a principle, the 15-minute City[14] focuses on the "minutes" of walking and cycling. The discourse mirrors the tendency of scientific studies on the examination of timesaving of walking.[15]

In addition to planning context, when considering the metropolitan dynamics, the 15-minute City may present itself as a discourse of complex implementation. We must also recognize the challenge of implementing it in contemporary urbanization reality. Since the opportunities, public equipment and jobs are not equally distributed within the territory, its operational implementation must be more effective. Even walkability and bike-ability are considered non-equitably distributed in urban metropolitan areas.[16] Context-sensitive research assumes that people's perceptions of a walkable built environment vary according to socio-economic contexts.[17]

The debate evolves around the 15-minute City concept, complementing it with considerations of access to public transportation as a crucial element for territorial cohesion in metropolitan areas.[18] Otherwise, there would be a risk of insisting on the fragmented logic of isolated neighbourhoods, accentuating socio-territorial asymmetries as well as compromising territorial cohesion and the systemic vision of a metropolitan area.

Such reflection unveils a conceptual abstraction when transferred to planning at the metropolitan scale. The discourse should refocus on the social and political value of Proximity under the lens of a context-sensitive spatial planning approach. Planning Proximity implies "Zooming the City" to the local terrain, which should be a strategy for citizenship-participatory city planning.[19] Consequently, Proximity would materialize itself spatially in neighborhood environments, through pedestrian and cycling accessible distances for daily activities and public transportation but manifested socially as it strengthens the sense of community and belongingness.

Although the review of the 15-minute City suggests some contradictions and challenging implementation looking into policymaking, it has a catchy discourse, being a vector of political and societal persuasion for transitioning to sustainable, healthy urban cultures. In fact, the 15-minute City concept recalls numerous endeavouring concepts over time,[20] such as Walkability,[21] recognising the beneficial effects of promoting walkable and cyclable cities against the impacts of car-oriented urban planning.
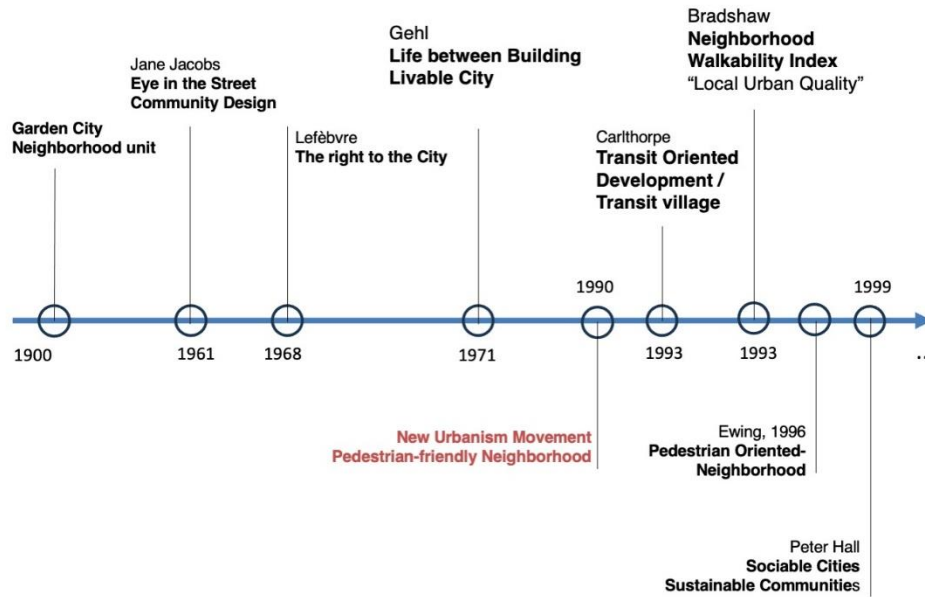
Figure 1. Review timeline of 15-minutes City conceptual roots- until 1999
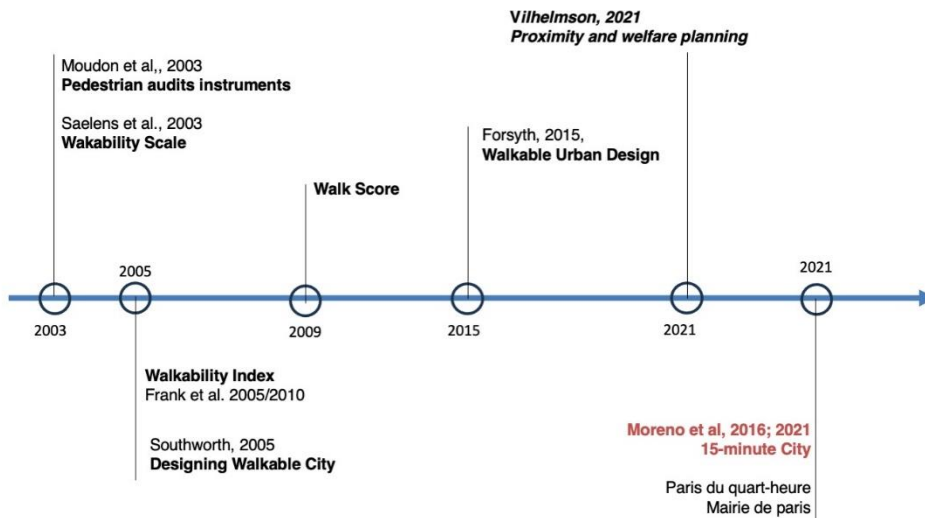

Figure 2. Review timeline of 15 minutes City conceptual roots- from 2000 until the 15-minute city concept is explicit.

THE DISCOURSE OF THE 15-MINUTE CITY. THE VALUE OF TIME AS COMMODITY KNOWLEDGE FOR PLANNING

The concept of the 15-Minute City invokes the temporal dimension of Urbanism towards planning short-distance daily mobility in the urban space. The Chrono-urbanism sought to respond to the urban and transportation dynamics emerging from Globalization.[22] The globalized dynamics have altered the urban rhythms of various cities, highlighting the time-space relationship as an essential factor in the production of contemporary urban space.[23]

This critique addresses the narratives that accommodate the 15-minute City discourse as a commodity knowledge. This narrative adds value to inhabitants' imaginaries by instrumentalising the notion of Time in planning.[24] The idea of saving time is overrated in Society's imaginaries.[25] The value placed on speed has been considered almost as a right in contemporary society. The prevailing paradigm emphasises efficiency in the pursuit of timesaving. The predominant narrative in transport research asserts that the time invested in travel is not productive or desirable.[26] Research on walking adopts mainly statistical approaches, relying on data such as travel surveys, pedestrian audits, and speed. This approach to Time is not limited to scientific studies on walking but reflects broader interactions within the planning domain and society. The prevalent focus on speed and efficiency in transportation underscores the subjective nature of time-space relation impacting individuals' perceptions. However, the emphasis on quantitative data fails to acquire the nuances of walking experiences, oversimplifying Time as a one-dimensional, mechanistic, and measurable concept.[27]

This statement denotes an understanding of walking movement as a regular clock rhythm,[28] disregarding multitudes of individuals' relationships with time, space, and identities manifest in walking. In other words, the debate would neglect a qualitative approach required to understand the social dimension of Proximity. The 15-minute city debate puts importance in walking rhythm through a quantitative and rational approach within the planning, not delving into Proximity's political and cultural dimensions.

However, new context-sensitive mindsets are subverting the conventional thinking of optimisation of walking time.[29] People may not always seek to minimise travel time but find value, engagement, and meaning in the experiences during walking. This perspective is particularly relevant when considering the complexities of walking, which is not a simple chronometric time pace.

The complexity of the time-space inherent in urban walking emerges as a central theme in understanding the dynamics of human perception.[30] Delving into this complexity, multiple temporalities and spatiality are intricately involved in people's walking experiences. This interplay between time-space is a mutually dependent relationship determinant to pedestrian movement. Lefebvre's conceptualization of Urban rhythm develops the disassociation of space, time, and place identity.[31]

In urban walking, these multiple temporalities go beyond a linear progression and involve nuanced dimensions, such as 'collective times' and 'experiential times. Here, time is not measured by clocks but is woven into the collective and individual experiences of pedestrians, introducing a richer understanding of the temporal aspects of walking that go beyond the traditional rational perspective.[32]

The critique characterises heterogeneous contextual temporalities[33] within the plurality of places in metropolitan urbanisation. The heterogeneous city territory also presupposes different urban rhythms. Lefebvre develops a theoretical reflection on the plurality of urban rhythms - Polyrhythmicity, pointing out two inseparable dimensions - rational and natural. The Rhythms definition combines quantitative aspects of time and those natural aspects inherent to moving bodies.[34]

In the urban context, there are subjective variables as regards people and their behaviours affecting urban mobility. Factors such as age group, income, education, gender, safety, and crime influence the urban dynamics of places.[35] Different groups respond differently to an environment regarding

accessibility on foot or by bicycle in daily activities. Thus, people's rhythms are defined through temporal paces of Spatiality and spontaneous human expressions of sociability. Both dimensions converge and require complementary quantitative and qualitative consideration.[36]

This point reinforces the context-sensitive nature of implementing "Proximity" instead of a "15-minute" city in a heterogeneous metropolitan territory. Proximity planning implies understanding the plurality of places and times within cities.[37]

Against this background, the 15-minute City discourse reflects the idea of Time standardized in urban spaces, hiding the contextual value of Proximity inherent to the "civitas" idea. This critique addresses the narrative that accommodates the 15-minute City notion as a commodity knowledge incorporated into planning. David Harvey points to the hegemonic values of Money embedded in the idea of Time-Space, which could govern planning cultures.[38] Temporal approaches applied to planning discourses would reproduce the control of Money over knowledge production. In other words, we suggest the Proximity notion in the 15-minute City discourse is co-opted as a commodity knowledge.[39]

This narrative exposes the instrumentalization of the overvaluation of Time in Society imaginaries by planners.[40] The planners' discourses establish a pillar in the cost/value of Travel Time in transportation, suggesting an association of economic, social, and environmental costs with life quality. Nevertheless, even if the 15-minute City fosters the policy discourses for City of Proximity, it emphasizes Time's spatial and rational dimensions, overlaying the social and cultural value impacting perceptions of Proximity.

The notion of proximity depends on built environments, places, and subjectivities implicated in social groups' mobility behaviors. Planning the City of Proximity transcends Time and Space to embrace aspects related to collective urban belongingness. In this case, Proximity incorporates socio-territorial, emotional complexities of urban experiences, conferring a sense of community, collective empathy and belonging. Therefore, we argue that the focus on the "15 minutes" masks the context-dependent nature of Proximity due to the standardization in policy discourse worldwide.

With this, we reinforce that Planning Proximity requires a look at contexts that influence active mobilities and sociability within participatory decisions,[41] rather than shortening time distances. Planning Proximity implies recovering the plural essence of urban rhythms considering both social and spatial dimensions. Anyway, the 15-minute City discourse suggests fastening travels and shortening distances instead of slowing the urban rhythm by strengthening proximity relations in both spatial and social dimensions.

Finally, this reflection still admits the 15-minute concept may retrieve the urban cultures of Proximity in society's imaginaries. But, although the 15-minute City proposes a change in urban culture discussion, its discourse is incorporated and subjugated to time-saving logic, acting as a political commodity tool. The emphasis on standardization of Walking Time may disregard social contexts and, thus, omit the character of sociability in the mobility path. Therefore, we suggest a conceptual emptiness of the 15-minute City discourse, absorbed by the power of knowledge globalization, under the disguised focus on Time.

WALKABILITY AS AN INPUT OF THE CITY OF PROXIMITY UNDER THE CONTEXT-SENSITIVE PLANNING APPROACH

The research literature defines *Walkability* as an urban quality composed of attributes for a pedestrian-friendly built environment.[42] Numerous Walkability studies have coined the definition as an indicator measured through built environment variables.[43] However, some research remarked that local and geographic particularities influence pedestrian behaviour, suggesting that Walkability is a contextually perceived urban quality. This point leads to the necessity for context-sensitive qualitative approaches.

The Walkability concept emerged within the debates, including the Proximity idea within Pedestrian Oriented Neighborhoods.[44] Many Walkability metrics, including Proximity, are applied objectively as distance or accessibility in tools or indicators. Nevertheless, Proximity can be interpreted as a subjective factor and also seen as an outcome of policies promoting Walkability, impacting Community Design, Livability, and Quality of Life in Neighborhoods.[45] Numerous works indicate the operational value of the urban micro area of neighbourhoods in studies relating the benefits of the walkable and cyclable built environment to community health and well-being.[46]

This causal approach, Walkability-Proximity, supports complex and heterogeneous interactions around planning the City of Proximity. This statement will develop a di-dimensional conceptualization between Walkability and Proximity, indicating the need for a contextual-sensitive approach.

Walkability-Proximity Causal Relationship

This review highlights similitudes in both Walkability and Proximity concepts. The literature indicates that walkability is part of the Proximity literature, as a requirement towards Urban Cultures of Proximity.[47] The dominant Walkability literature emphasizes physical aspects of the urban space (references), although important approaches reinforce contextual and subjective variables of pedestrian behaviors.[48]

However, the Proximity and Walkability concepts display a causal relationship between them, which would lead to their implementation into policies. Recent planning approaches have endorsed this view exploring walkable proximity to public services, collective equipment, public transport and daily urban activities".[49] Those approaches emphasize Walkability as an element of Social and Environmental Policies throughout the notion of City of Proximity.[50]

The causal relationship of Walkability-Proximity stands within policy themes and holds bi-dimension impact interaction: social and spatial. On one hand, Proximity would be an input of Walkability in the Spatial dimension, defined as short and accessible distances to everyday services and activities. On the other hand, Proximity would also play as an Outcome of Walkability in the social dimension. In other words, Walkability plays a bi-dimensional role, being an outcome and input from the causal relationship with proximity (Figure 1). The causal relationship suggests Walkability as a common element for potentialising both Social and Spatial dimensions of Proximity in Planning towards Livability, Sociability, Health, and Sustainability.[51]

The causal interaction around Walkability implementation within 15-minute-city planning goes beyond proximity as a time/ speed variable, involving complex dynamics impacting social urban lives.

The bi-dimensionality of the Walkability-Proximity relationship evokes some authors' discussions on the duality of urban rhythms governing the walking experience.[52] Spatial and temporal aspects of walking are read from both an objective and a subjective perspective.

In other words, urban rhythms define a plurality of interpretations about walkable proximity, depending on social and spatial contexts. Therefore, the concept of proximity in planning should incorporate walkability due to its dual causal nature - input-outcome, implying both quantitative and qualitative approaches, but above all, with a local and culturally context-sensitive understanding.
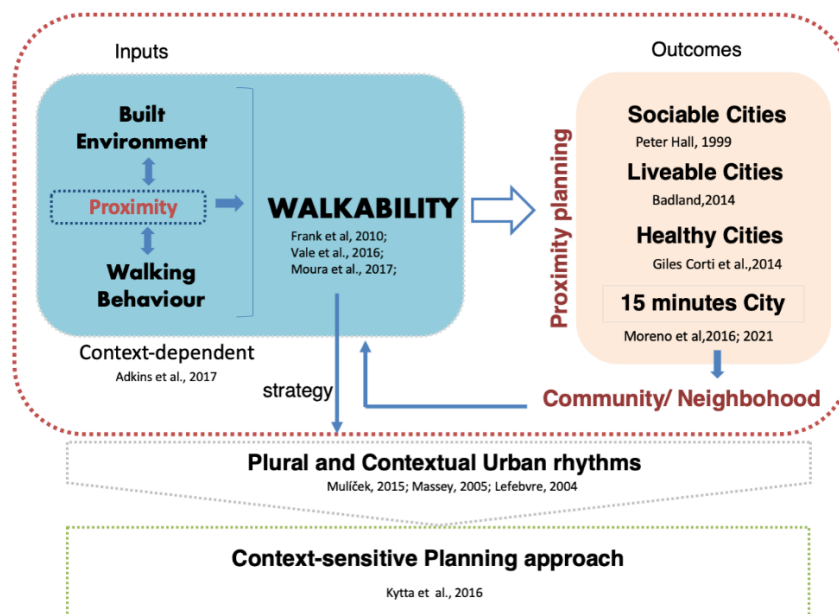
Figure 3. Walkability-Proximity conceptual framework.

Context-sensitive approach for Planning Proximity

The dual causal nature of Walkability within Planning proximity implies a context-sensitive approach. Components such as connectivity, comfort, convenience, conspicuousness, conviviality, and safety[53] influence walking behavior and the levels of facilities for walking.[54] Those components interfere with the interpretation of Walkable Proximity as a subjective quality.[55] This perspective introduces a new understanding of Walkability as an assemblage[56] within urban planning, given that this concept is perceived heterogeneously depending on urban contexts and rhythms.[57]

For this reason, it is essential to adopt an approach to defining components of Walkability through work that involves spatial and social aspects in diverse urban territories.[58] It is essential to recognize the conceptual complexity in defining the Walkability concept, impacting per se, the City of Proximity planning. This way, Planning Cities of Proximity presupposes tailoring urban policies to address built environment attributes affecting people´s walking and cycling habits and perceptions.[59]

Walkability's heterogeneous and complex nature corroborates the context-sensitive approach to Planning the City of Proximity. Context sensitiveness is defined as an understanding of contextual variations among different city territories. This approach aims to link spatial inputs to social outcomes, focusing on spatial specificities and local cultures.[60]

The contextualisation of Walkability to local realities strengthens innovation and effectiveness of discourses and knowledge practice. A context-sensitive approach would "zoom in" on localities to understand their community and neighborhood variables that affect walking and cycling to daily activities. Thus, planning Walkability within Proximity City represents a strategy to slow down the standardization of urban rhythms and "Zoom in" on the inhabitant's relations. Walking cultures would result from urban space transformation to counteract a fast and volatile globalized urban society.[61] Finally, Walkability works as an input strategy for context-sensitive proximity planning, holding an integration role for both spatial and social dimensions of Proximity.

CONCLUSION

Planning the City of Proximity embodies the fruition of the city through walking, reducing the speed of city life, and strengthening relationships of sociability by a people-centered perspective. The review developed a background genesis of 15-minute City within Walkability, TOD, New Urbanism and 15-minute City, Community design; Pedestrian Neighborhoods principles under Sustainable urban planning approaches in reaction to car-oriented urbanization and urban globalization.[62] The literature indicates different terms addressing similar concepts for enduring urban problems.

We proposed a critical reflection on disseminating the 15-minute City in the knowledge from research to planning. We point to the overvaluation of Time-Space relationship in planning cultures,[63] framing the 15-minute City as a commodity knowledge for political discourses.[64] The critique addresses the focus on Time in the planning discourses through the "Standardization of "15 minutes". This view neglects contextual urban time, spaces, and omits the social dimension of Proximity.

The debate permeates urban planning, becoming promising among policymakers and academics to redefine the essence of the 15-minute City concept through a context-sensitive approach.

The review indicates a causal relationship Walkability-Proximity as an integration of spatial and social dimensions in Planning. This reflection also contributes to putting Walkability as a context-dependent input for Planning the City of Proximity.

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MIND IN THE CITY: WHY A CITY'S WALKABILITY IS THE KEY TO ITS COGNITIVE AFFORDANCES

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INTRODUCTION

This paper introduces 'way-ability' as a rule of thumb for gauging the cognitive affordances of a city, offering a framework whereby the livability of a city is best understood through modeling its nested individual trajectories at multiple scales of affordance. The cumulative affordances (mental, physical, emotional) of a city can only be understood through mapping inhabitants' cumulative way-makings—the trails and links their sensory bodies forge and follow in order to make sense of their ongoing encounter. Crucially, these are as cognitive as they are corporal.

The city encounter spans traditional distinctions of mind/body. Until now, however, the cognitive affordances of a city have not been mentioned (at least not directly) in discussions of livability. Current measures, such as 'walkability' focus on the city as a traditional, physical, spatiotemporal experience. While this is certainly important, this paper seeks to move beyond assumed physical/mental dichotomies in its discussion of trajectories: A city is the nested cognitive affordances unique to all individual positions that are part of it.

This extends the work of J.J. Gibson's *affordance*[1] and Lucius Burckhardt's Spaziergangswissenschaft, (translated into English as "walking science" but often referred to as "Promenadology" or "Strollology"[2]) through the lens of way-making, a philosophy of cognition which posits all making-way as cognitive.[3] Here, an agent's cumulative sensing and movement through its encounter is understood as interlinked with cognitive affordance. This expands current discussions of 'walkability' into 'way-ability,' a term inclusive of all individual means of accessing a city, and one that applies across species, addressing some of the limitations of using walkability to measure livability, while still including it as an important element of urban planning.

STRINGS AND PEARLS

One helpful way to imagine way-ability is to revisit the work of Lucius Burckhardt and his notion of the "string of pearls" that is each citizen's experience of a city.[4] Here, the pearl is understood as a cluster of sensory regularities that comes to be taken as a whole gestalt (i.e., a bedroom, a city park). These strings form as bodies encounter and accustom themselves via development and daily life. These strings of pearls become our overall resonances and groupings—what we name as homes, genres, disciplines, cities, neighborhoods, etc.

These pearls are physical, but they are also social and mental. The string of pearls we call home, for example, might include the garden, streets, kitchen, our childhood bedroom, *and* the feelings, ideas, and memories we developed within them; these are inextricable.

A city is an ongoing encounter of sensory regularities—shapes, sounds, colors, smells, touches—and to exist in them, recognize them, anticipate them, and communicate about them, we form strings of pearls. Such pearls and strings are different for each of us: our city walk together will activate different strings for me than it will for you, even as we walk the same physical street. These strings and pearls shift in and out of one another, overlap and cohere, and cannot be separated from the walking, crawling, swimming, riding, etc. of the whole-body 'wearing' them. Still, as Burckhardt emphasizes, the only person who can judge the effects of those strings are the ones wearing them; only the city's citizens can measure its livability.[5]

Nested Strings, Nested Trajectories

Another important element of Burckhardt's work is *the stroll* as a means of observation. Any string of pearls is also a trajectory of movement, a path or walk. Though we share similar streets and sidewalks, making way demands observation and instigation if we are to see what he calls the "invisible city"—the wider cognitive paths that form us and that others experience distinctly.[6]

Might there be some way of mapping those trajectories in their dynamism so as to better observe their nearness to our own?[7] Without such visualizations, as scientists and designers working on city planning, we are likely to pre-reflectively assume the perspectival paths we are on as the paths others are on, almost as default. Because much of the cognitive trajectories of a city are invisible, however, they require us to *sense strangely*—outside of our usual comfort zone. Burckhardt criticizes the "typification" of usual mappings, for example, agreeing with geographer Gerhard Hard in finding that "typical" perception is often pre-reflectively framed and controlled by the inertia of dominant trajectories.[8] Avoiding such assumptions and unreflective inertias requires bringing awareness to a city's cognitive affordances and their trajectories, extending the measurement of livability beyond geographical and bodily-proximal access so as to include cognitive regularities (paths of thought) and access.

Geographical and cognitive affordances are impossible to disconnect. Still, they align differently according to each individual trajectory, to the dynamical state of each string of pearls. Each position encounters the landscape through unique physical, mental, emotional, and representational trajectories of development; each starts at a different place. A city's way-makings are its cumulative affordances at these nested levels and can only be understood as first-person affordances nested in third-person contexts.

Livability is what the city affords each particular position, and its ability to align with each position's continuous unique heritage without discounting it. Instigating actions, discussions, and possibly mathematical models that increase awareness of these unique trajectories may come through an investigation into *way-ability*.

WAY-MAKINGS

According to way-making, cognition is not distinct from the body and its feeling and perception; it is that same biological organization and process. It is the body's sensory calibration with its encounter into patterns of behavior. These patterns are trajectories through landscapes that are themselves dynamic inter-relations between the agent and the encounter—grooves pre-reflectively followed the more they've been followed.

Way-making posits cognition as how the brain and body make sense of the world, how the body develops its sensory systems by using them. Recent philosophy argues this is an embodied and ecological process[9] of sensing towards way-making—making sense of one's patterns of sense, sense-making about how one has *made way thus*. As Schultz writes in discussing Burckhardt, "People's views and ideas about landscape differ. They are shaped by the experiences they have already had, by

the interests that guide their thoughts and actions, and by the context in which they speak of landscape…".[10]

All thinking is making-way in that regard, as cognition is not only the thoughts and memories we are *aware of* thinking and perceiving, but also the ways our bodies align with and fit to their ongoing encounters through bodily development & inherited structures, including landscapes—the cognition that we are not aware of as it is happening. Sense-making is a scale of way-making done with awareness of its own process. It is our bodily systems' abilities to reflect upon these patterns that give us perception of memory and thinking: As philosopher Evan Thompson puts is: "mind is continuous with life."[11]

Heuristics and scientific examples to help us get a grip on this have recently appeared in various fields.[12] Hippocampal research, for example, has expanded greatly over the past century and shows us how knowledge acquisition, memory, and spatiotemporal navigation are a common process,[13] proposing potential cognitive and computational models for how navigating and thinking can be understood as nested scales of the same process.[14] Likewise, biological, computational sciences have recently moved towards similar conclusions: Michael Levin's lab at Tufts, for example, discusses navigation as an invariant for analyzing cognition.[15]

Cognitive Affordances

As a philosophy of cognition, way-making posits that landscapes are experienced as cognitive affordances. J.J. Gibson defined affordances as 'potentials of action' formed by the relationship between an agent and its environment; parameters of opportunity resonating between a body and its encountering.[16] Every cityscape has unique cognitive affordances for every position that is part of it, just as the same lake will afford different things for a human, a fox, a fish, or an insect.[17] The affordances depend on the position, even as the landscape is shared. Our thoughts, memories and emotions are continuous with this process in their formation and influence on livability.[18]

Humans are able to reflect on trajectories within, as well as those of the body as a whole, adding 'mental' and 'emotional' layers to trajectorial continuity of affordance. Our best chance of measurement is in observing and modelling these different trajectories or paths, these strings of pearls, which requires taking as many unique strings (physical, emotional, mental, historical) into account as possible, and observing their inter-relation. There are no positions except in relation to other positions. In the words of Gregory Bateson, "it takes two to know one".[19] As Jakob von Uexküll writes, this is how "every living being perceives the world from its own perspective" at the same time that the "community of nature" emerges from those dynamic, combined paths.[20]

Designing cities means asking how we connect these nested landscapes and trajectories in ways that improve the health of their communities, allowing the complexity of entangled trajectories of past, present, and future geographies to be observed by those who have not walked them. In other words, designing a city is designing its cognitive affordances *and* making them more visible. Doing so means beginning to imagine how the livable city could be modelled as a dynamical system of nested landscapes, one that supports diverse trajectories and instigates trajectorial communication and new, healthier way-makings. Lucius Burckhardt might have been the first to discuss walkability and cities, and revisiting his work through way-making may be a step in this direction.

FROM WALKABILITY…

The term 'walkability' has become popular lately when discussing how to design cities for livability.[21] Measuring walkability is often cast as assessing the quality of mobility a city enables its pedestrians. The terms 'walkability' and 'pedestrian' localize this measurement to those who walk, though

numerous efforts have been made to overcome this limitation by inclusion of wheelchairs and other aids.[22]

Discussions of walkability usually revolve around accessibility to particular necessities and amenities, to landscaping and sidewalks, to the overall condition of the environment being walked (is shade provided?), and other contested parameters.[23] These are important and interesting debates, but regardless which parameters are chosen, walkability remains limited for the following reasons: it often disregards forms of movement that are not walking (even when it tries not to); it often assumes city-experience to be only a matter of traditionally physical access; it fails to illuminate the myriad cognitive trajectories that can be part of the same literal city walk, and finally, it limits us to the human perspective without offering a way to consider the way-makings of animals, insects and plants.

…TO WAYABILITY

Rethinking walkability as trajectories of cognitive affordance means expanding 'the walk' to 'the way' and 'walkability' to 'way-ability' (which then includes walkability as a subset). Way-ability considers multiple layers and scales of affordance and access when considering a city's livability because it includes all methods of movement, and all landscapes. Whether affordances of a marginalized trajectory that need to be acknowledged widely, or individual emotional and personal trajectories nested within context,[24] wayability offers the chance for inclusion at varying scales. It also demands visualizing and modelling complexity rather than linearity.[25]

Way-ability addresses the limitations of walkability without collapsing forms like driving and walking into the same scale of affordance. It allows us to measure those as having different individual and communal affordances. Looking at way-abilities rather than walk-abilities also means multiple species and their way-makings (i.e. the flight patterns of birds) could conceivably be included in a city's overall way-ability.

Way-ability is also an inclusive term when it comes to layers of experience—it can be used in physical, conceptual, emotional, and virtual spaces, so we begin to understand how such landscapes are nested, multi-layered, and complex (not complicated).[26] Way-ability shifts us towards adopting non-linear scales in favor of nested, complex systems visualization, further opening urban planning to the models of computational complexity and network science.[27] Using graph theory, for example, we might model how way-ability is not just a score of how close things are to a person, but also about the nearness of an agent to the normative conceptual, social, historical, and cultural trajectories of a city's prime affordances.[28]

From the start, way-ability takes each position as a unique trajectory that can never be fully inhabited but can become a System 3 landscape[29] from which the position can be representationally inhabited (avatar-like). Here, the ultimate goal is in the sharing of experience on trajectorial levels so as to cover and recognize more of the overall meshed (always shared) fabric of possible experiences within the same geographies. The question becomes how many cognitive positions can be adequately viewed.

One way to begin to answer this is to find ways to computationally model individual way-makings and demonstrate their scaling into larger, more communal ones. How do individual strolls layer into social strolls? Which trajectories are erased, and which are underlined in doing so? How might we begin mapping these 'walks' and 'ways' in mathematical space? We can now come back to Burckhardt's science of walking and think through it as a science of way-making, considering the multiple scales and dimensions of cognitive affordance towards clarifying some possible actions and modeling. The three suggested here are: cognitive path-making, place-printing, and intervention.

Cognitive path-making

In discussing Burkhardt's work, Weisshaar shows that Burckhardt's style of strolling has the goal of leading to a more conscious awareness, a new walk, rather than just a better geographic location. Way-abilities can lead to insight, creating new paths between what was once unreachable.[30] The key is to become aware of what we now unknowingly take for granted, observing the "invisible design" and the "connections behind things".[31] Meyer-Abich has written that "Environmental problems are problems of perception."[32] We might say the same about urban problems at various scales: when there is less perception or observation, there is also less chance of building better ways.[33]

A primary part of Strollology is the cultivation of new levels of awareness, of heightened observation, towards new cognitive paths. Having access to the notion of oneself as agent is a way of developing awareness of cognition, observing the affordances of one's encounter. We do well in becoming aware of cognitive affordances encountered on trajectories other than those we experience in first-person because it allows us to communicate about them and in so doing, lay down better ones.

In essence, this is already the activity of much of our arts and sciences. Whether by microscope or telescope, by story or music, these endeavors make new ways for us to measure or experience the world from scales and positions other than our own. Such conscious cultivation of affordance can be done in all our way-makings, if we prompt ourselves towards observation and frame cognition from this intention, yet another nested level of way-making.

Mapping placeprints

We develop place-prints that are as original to us, and as similar to others, as fingerprints. They shape how we experience all we encounter. Every time I go past a certain street corner in Berlin, for example, I remember the podcast I was listening to there. In another park, I remember a particular walk with a particular person. When on a certain track at the Hauptbahnhof, I remember having my phone stolen. When I go to a new city, I often think how of it looks like a city in Berlin, or New York, or some other city I've long lived, always associating it with the regularities of some already-existing trajectory. All this is part of urban livability for me; it is not separate from the ways I make. Is there any way to map such experiences so that their signatures can be shared?

Burckhardt believed the planning and politics that go into the creation of cityscapes must connect to the physical needs of those living them. The people using a space are its experts and the ones to consult towards designing and planning.[34] Can we create potentials for participants to map and share their expertise mathematically? Is this a good use for A.I. modellings? Can we map and share cognitive trajectories and see how these create nested urban livability? Is there anyone who can code this App? If so, it may go a long way towards building a more livable city, making it more intimate and observable.

Instigating interventions

Expanding another call from Burckhardt's work, these shifts of awareness, observation, and demonstration expressed above could be done through spatial interventions.[35] An intervention is a sudden shift in usual regularity, a pull at the string of pearls, the glimpse of another layered place-print that was not visible before, though was always there. Often, we do not notice or understand that there are many different overlapping trajectories of cognitive affordance all around us all at once in our shared spaces. Interventions are ways of calling attention to this. Traditional Burckhardt methods involve unexpected artwork in the midst of the cityscapes. Today, we could imagine ways of making the invisible visible through Augmented Reality or VR that plays or replays past and present place-prints in the ongoing space.

CONCLUSION

Way-ability is livability. A city's way-ability is the cumulative affordance for all its inhabitants and its recognition of their unique trajectories. The laying down of paths is the laying down of parameters of affordance: We accept that parking lots have to be concrete, until we realize they could be plant-based; we assume another person experiences this city street as we do, until an intervention shows us what once happened to them or to their ancestors there. Taking way-ability seriously changes our relationship to landscape and our built environments by connecting us to others and their trajectories and making-way for new ones. The livable city is the city with space for all its agents' trajectories even as those trajectories cross paths and change. When way-making is done reflectively, way-abilities increase. When way-making is done reflectively, way-abilities become opportunities for sharing and improving cities at various layers. They involve multiple trajectories, improve cognitive affordances, illuminate regularities and invisibilities, and develop healthier agency.

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SPECULATIVE DESIGN AND INTERIORITY: REIMAGINING THE INTERIOR FOR LIVABLE CITIES

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INTRODUCTION

Designing liveable cities is critical in urban planning, architecture, and design. An essential aspect of achieving this goal lies in designing the interior of our homes, which plays a pivotal role in shaping spaces that foster well-being, social interaction, and a sense of community. However, conventional approaches often neglect the social and psychological dimensions that profoundly influence our experience within these interior spaces.[1] To explore a more innovative approach, a studio project involving second-year interior and spatial design students from Griffith University sought to integrate speculative design with an interiority perspective. Through speculative design, students embarked on envisioning alternative futures using fiction and scenarios, thus challenging assumptions and inspiring innovative interior designs.[2] At the same time, the interiority perspective prompted students to question interior spaces as reflections of individuals' self-perception and their relationship with the world. By combining these approaches, the project aimed to create designs that hold more significant meaning and impact, thereby promoting social interaction and enhancing the well-being of residents.

THE SPECULATIVE LENS

In Semester 1, 2023, second-year interior and spatial design students were introduced to speculative design methodologies during a design studio class. This methodological approach serves as a guiding framework that leads students through a journey of envisioning and prototyping speculative scenarios. At the core of this methodology lies a pivotal phase of critical reflection and analysis, during which designers meticulously evaluate the speculative possible futures and tangible design ideas.[3] Through rigorous assessment, designers delve into the potential benefits, drawbacks, and ethical considerations associated with their speculative designs. The reflective process becomes instrumental in refining and iterating the designs, which ensures their practical relevance in tackling real-world challenges and their potential to engender meaningful and positive experiences within interior spaces.

By embracing the speculative design methodology, interior designers are prompted to transcend conventional thinking and dare to question established norms.[4] This approach fosters an environment in which designers unreservedly embrace uncertainty, venture into speculative thinking, and embark on exploring possibilities that may initially appear unconventional or radical. Such an environment nurtures a mindset of curiosity and exploration, which empowers designers to envision alternative futures and actively contribute to the ongoing discourse about the profound impact of interior design on individuals' lives and the broader community.

Amidst this educational journey, experts in the field emphasise the significance of speculative design in challenging not only assumptions and cultivating innovation within the realm of interior design but also boldly imagining alternative futures and risk taking.[5] This process prompts critical reflection and transformative thinking. Moreover, the exploration of speculative design also brings to light essential cultural and ethical implications within design practices.[6] It urges designers to be mindful of the profound impact their interiors may have on the fabric of society and cultural identities. In a more expansive perspective within the realm of interior and spatial design education, the incorporation of speculative design endeavours not solely to nurture inventive concepts; it also functions as a catalyst for instigating transformation within the sector.

Questioning traditional approaches

Within the domain of interior design, historical emphasis has been placed predominantly on its aesthetic and functional aspects. [7] Designers have always strived to curate spaces that evoke visual appeal and foster practical utility. Aesthetics play an indispensable role in this pursuit, as designers meticulously select colours, textures, patterns, and furnishings to attain visual harmony, while functionality ensures that the spaces are optimised for practical purposes.[8]

However, these conventional paradigms tolerate certain limitations, particularly in their capacity to address the profound social, cultural, and psychological dimensions intrinsic to interior spaces. Unfortunately, these paramount aspects are often overlooked or inadequately addressed within the framework of traditional approaches.

The social dimension of interior design is concerned with the interactive dynamics and communal engagement among individuals within a given space. Regrettably, this dimension is all too frequently marginalised, which results in spaces that fall short in fostering meaningful social interactions and nurturing a sense of community.[9] Consequently, occupants may experience detachment and isolation within such environments.

Similarly, cultural diversity constitutes another pivotal consideration frequently disregarded in conventional interior design. Spaces devoid of cultural sensitivity may fail to resonate with the diverse experiences and identities of their occupants.[10] This lack of consideration can lead to sentiments of alienation and unease, particularly among individuals whose cultural backgrounds do not align with the predominant norms represented in the design.

Moreover, the psychological dimension of interior design, encompassing elements such as spatial planning, lighting, colour, acoustics, and materials, exerts a profound influence on occupants' overall well-being and comfort.[11] Sadly, this dimension is often overly focused on, resulting in spaces that may boast visual grandeur, yet inadequately cater to the emotional well-being and comfort of their inhabitants.

By limiting focus to aesthetics and functionality, traditional interior design approaches tend to overlook the inherent dynamism of interior spaces. These spaces possess the inherent capacity to exert substantial influence on human behaviour, emotions, and interactions. To transcend these limitations, it becomes imperative to explore alternative approaches that embrace a more holistic understanding of interior design, i.e., approaches that encompass the broader dimensions of social, cultural, and psychological influences.[12]

By adopting such a comprehensive approach, designers are better positioned to create spaces that transcend superficial visual appeal and mere functionality. Their aspiration is to cultivate environments that enrich individuals' lives through profound experiences, foster vibrant social engagement, and ultimately elevate the overall quality of life for their occupants. This transformative shift in design philosophy envisages interior design as a potent instrument with the capacity to profoundly impact the lives of those who inhabit these thoughtfully curated spaces.

Speculative design methodology

The methodology of speculative design comprises several key stages that guide the process of envisioning and prototyping speculative scenarios. At the outset, designers conduct extensive research and analysis to identify emerging social, cultural, and technological trends that may influence the future of interior design.[13] This research provides valuable insights into the evolving needs, desires, and behaviours of individuals and communities, which enables designers to craft speculative scenarios that effectively respond to future challenges and opportunities.

The next stage involves creating fictional narratives or stories that contextualise the speculative scenarios.[14] These narratives serve as powerful tools for exploring the social, cultural, and psychological implications of the design interventions. Through storytelling, designers and stakeholders alike are immersed in the envisioned future, which leads to a deep understanding of the potential impact and consequences of design choices.

Further, prototyping assumes a pivotal role in the speculative design methodology. In prototyping, designers produce tangible artifacts, such as physical models, interactive prototypes, or visual representations to bring the speculative scenarios to life.[15] These prototypes serve as provocations that facilitate meaningful engagement with stakeholders and users to provoke feedback, insights, and discussions about the future implications of the designs.

Finally, the methodology culminates in a phase of critical reflection and analysis of the speculative scenarios and prototypes.[16] Designers rigorously evaluate the potential benefits, drawbacks, and ethical considerations associated with the speculative designs. This reflective process ensures the refinement and iteration of the designs. It ensures that they address real-world challenges and have the potential to create meaningful and positive experiences within interior spaces. In addition, it questions norms, sparks critical reflection, and addresses cultural and ethical implications. Auger[17] noted how speculative design stimulates creativity by exploring emerging trends. Jégou[18] held that it enables prototyping of new ideas and technologies and pushes interior design boundaries. Gaver et al.[19]emphasised its catalytic effect on creativity through encouraging radical envisioning and nurturing innovation through uncertainty. Indeed, speculative design uncovers possibilities to enhance human experiences within interiors.

The futures cone in speculative design

In speculative design, the 'futures cone' is a metaphorical representation of the multiple potential futures that can emerge from the present moment.[20] It is often depicted as a cone-shaped area that widens as it extends into the future, signifying the increasing number of possible outcomes as time progresses. The futures cone illustrates that the further we project into the future, the more uncertain and diverse the potential futures become. [21]

Within the futures cone are various alternative paths, scenarios, and possibilities, rather than a single, predetermined future. Speculative designers use this concept to explore and envision different futures that may arise from current trends, technologies, and societal changes. By employing the futures cone as a conceptual tool, designers can probe the ramifications of various choices and developments, opening new perspectives and stimulating creative thinking about potential trajectories and their implications. The goal is not to predict the future with certainty but to provoke critical reflection and engage in thought experiments that challenge assumptions and inspire innovative solutions for the world of tomorrow.
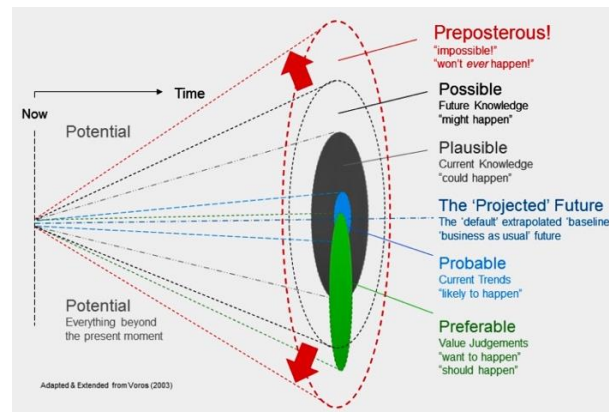
Figure 1. Voros (2003), The Futures Cone.

THE INTERIORITY LENS

The concept of interiority encompasses a wide array of disciplines that span psychology, literature, philosophy, and architecture.[22] Diverging from the conventional understanding of 'interior', which predominantly concerns tangible attributes, interiority transcends materiality.[23] Instead, it exists as an abstract essence, unbounded by spatial demarcations and topographical limitations and evolving in meaning and scope over time. [24]Interiority extends beyond the confines of architectural constraints and interfuses with the realm of human psychology while shaping the intricate interplay between the mind and physical spaces.[25]

Despite its seemingly elusive and distant nature, interiority significantly impacts our experiential engagement with a place and fills it with a sense of familiarity and profound importance.[26] It amalgamates intangible mental imagery with concrete spatial encounters, thereby contributing to the overall sense of place within an interior setting.[27] In the context of interior design, interiority assumes an essential role in endowing spaces with distinct personalities and unique identities, which are achieved through the seamless integration of the building envelope with interior elements.[28] Eminent architectural figures, such as Mackintosh, Le Corbusier, Aalto, and Loos are esteemed for their adeptness at harmonising building envelopes with interior content, which fosters a profound interaction between inhabitants and the architectural space.[29]

Contemporary architectural practices, often shaped by economic constraints, tend to compartmentalise collaboration between architects and interior designers, which leads to limitations in holistic spatial dialogues.[30] This partitioning of responsibilities, with architects focused on structure and interior designers on fit-outs, hinders the creation of immersive and impactful spaces for occupants.[31] While boundaries play a pivotal role in defining interiority by demarcating spaces of inclusion and exclusion, the dynamic interplay between interiority and exteriority extends beyond physical building bounds and is interwoven within architectural confines, radiating its influence .[32]

Despite its inherent complexity, interiority remains an integral facet of routine experiences and is intrinsically linked to habitual practices and cognitive processes.[33] Endowed with a profound personal significance, interiority moulds individual identities; it perpetually evolves in tandem with the unfolding of diverse experiences.[34] Each individual privately engages with their interior dimensions and constructs a unique interpretative framework to grasp their world.[35] As such, interiority continually evolves and contributes to the singular essence of each autonomous being.[36]

From design fiction to imagined realities

As we have discovered, the intersection of speculative design and interiority presents a powerful and transformative approach for shaping interior spaces. This fusion allows designers to visualise and actualise potential futures, all the while intricately incorporating the experiential, psychological, and cultural aspects that influence how people engage with interior environments.

By blending speculative design and interiority, designers can not only envision potential futures but also bring them to life within interior spaces. This integration enables a thoughtful exploration of experiential, psychological, and cultural elements that deeply impact human interactions within these environments.

As previously stated, speculative design as a methodology allows designers to explore design fiction to imagine possible futures through fictional narratives. It encourages a mindset of curiosity and exploration and invites designers to embrace uncertainty, take risks, and envision possibilities beyond the constraints of the present.[37] On the other hand, interiority recognises interior spaces as dynamic, experiential realms that influence emotions, behaviours, and well-being.[38] Interiority also acknowledges the social, cultural, and psychological dimensions that deeply impact human experiences within interiors.[39] By acknowledging the significance of creating environments that foster a sense of belonging, identity, and connection to both the self and the surrounding community, interiority provides a holistic perspective on interior design and keeps it focused on the users.[40] In turn, by grounding their design fictions in interiority, designers can create environments that resonate with the diverse experiences and identities of the occupants, thereby fostering a sense of belonging and connection to the space.[41]

Student project

In the domain of interior design, the principle of liveability assumes a prominent role by illuminating the trajectory toward designing spatial environments that transcend mere functionality and aesthetics. The interplay between urban design and city form assumes a pivotal significance in shaping the very essence of interior spaces, thereby exerting profound influence over the vitality and vibrancy of a town or city. As practitioners in the field of interior design, we recognise that the physical environment serves as an expressive canvas upon which the art of community-building finds manifestation.[42]

This year's project, undertaken by second-year interior and spatial design students, embarked on an exciting exploration that delved into the unique characteristics of two contrasting urban communities: the bustling city of Brisbane, Australia and the lively City of the Gold Coast, Australia. Both urban landscapes have long embraced the fundamental pursuit of augmenting the quality of life and nurturing sustainable development within their respective boundaries. Nevertheless, amidst the backdrop of current housing inadequacies, affordability predicaments, and a real sense of disconnection, these communities find themselves at a pivotal juncture. Our endeavour was to navigate the intricacies inherent in their individual contexts, where the promise of liveability emerged as both a beacon and an encompassing challenge.

Approach

Commencing with an exploration of urban liveability, students embarked on a research journey delving into the intricate interplay of social and environmental dynamics within the Australian context. However, their trajectory transcended conventional boundaries as they were prompted to engage with the speculative methodology. This innovative approach motivated them to transcend the limitations of conventional strategies and embark on a transformative journey. Envisioning an enhanced urban future, the project brief underscores the need to recognise that our endeavours often involve framing challenges within an optimal context. Figures 2, 3, and 4 depict conceptual ideation

models that address the identified liveability challenges of social exclusion, environmental complexities, and privacy deficiencies within apartment living.
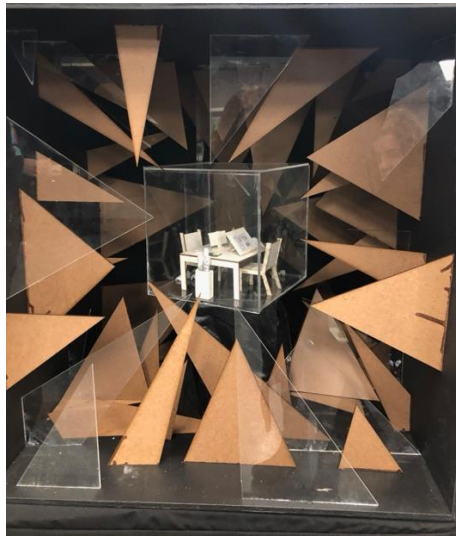
Figure 2. Ideation scale model: Protecting the self.

Figure 3. Ideation scale model: Structured lives, both open and concealed.

Figure 4. Ideation scale model: Layered emotions.

Moving forward, students had the opportunity to design a multitude of conceptual models that delved into various facets of speculative design and its seamless integration with the interiority perspective. Some options for these conceptual models included:

1. **Futuristic Living Environments:** Develop concept models that envision alternative living spaces set in the future. Consider how interior layouts, materials, technologies, and spatial arrangements might adapt to address evolving societal needs and challenges, while still providing a sense of comfort and familiarity.

2. **Human-Centered Adaptations:** Create concept models that illustrate how interior spaces can adapt to changes in climate, technology, and lifestyles, while maintaining a strong focus on human well-being and connection. Explore how interiors could incorporate sustainable practices, flexible layouts, and sensory design elements to promote a harmonious relationship between individuals and their surroundings.

3. **Cultural and Identity Expression:** Design models that highlight the role of interior spaces in expressing cultural identities and personal narratives. Consider how speculative design can lead to interiors that celebrate diversity, challenge normative standards, and create inclusive environments where people feel a sense of belonging and self-expression.

4. **Collaborative and Shared Spaces:** Craft models showcasing interior designs that foster communal living and collaboration. Explore how spaces could be reimagined to encourage shared resources, cooperative activities, and meaningful social interactions among residents, promoting a stronger sense of community.

5. **Technological Integration and Well-being:** Develop models that explore the integration of advanced technologies within interior spaces to enhance well-being. Consider how speculative design could lead to environments that seamlessly incorporate virtual reality, biophilic design, or AI-driven elements to support residents' physical and emotional health.

6. **Narratives of Transformation:** Create models that narrate the transformation of interior spaces over time to illustrate how they evolve in response to changing needs, values, and external factors. These models could depict how interiors adapt and offer insights into the dynamic relationship between people and their living environments.

7. **Emotional and Sensory Engagement:** Design models that focus on sensory experiences and emotional engagement within interior spaces. Explore how speculative design can evoke specific feelings, memories, and connections through the use of materials, colours, textures, and spatial arrangements.

Consequently, as we move forward, the culmination of these exploratory activities is the preparation of final designs for an upcoming exhibition. Set to take place this September, the exhibition serves as a platform for students to showcase their distinctive approaches and feature a comprehensive display of ideation models, design development, and innovative solutions. Each display encapsulates the culmination of detailed ideation, thereby reflecting the synthesis of speculative design and the interiority perspective. These exhibits will not only portray creative conceptualisation but also will embody the fusion of visionary thinking with the profound interplay between interior spaces and human experiences. This upcoming event provides an opportunity to delve into the multifaceted domain of interior design, in which a diverse collection of innovative design narratives will be on display to push the boundaries of conventional practice.

CONCLUSION

In conclusion, the synergy of speculative design and interiority in interior and spatial design redefines the approach to liveable cities. This paper explores their individual significance and combined potential. Griffith University's design students pioneer this exploration and translate complex methods into tangible proposals for the cities of Brisbane and Gold Coast. This innovative approach empowers designers to challenge assumptions, envision alternative futures, and experiment with unconventional ideas. The speculative lens fosters creativity and innovation. Simultaneously,

interiority emphasises design's psychological, social, and cultural impacts. The projects by second-year students exemplify this synergy and aim to enhance urban liveability. They forge environments that resonate with occupants' experiences, thereby fostering belonging and well-being. These visionary designs hold promise for redefining city living and inspiring new ways of thinking about design's transformative power to shape the future of urban spaces.

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DIFFERENT PERCEPTIONS ON BUILDING URBAN SOCIAL RESILIENCE AMONG DUBAI AUTHORITIES

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INTRODUCTION

This paper explores the existing social resilience perceptions in Dubai, a city whose authorities have vowed to make resilient and sustainable. The limited experience with resilience-building, coupled with the increased vulnerability and the unique socio-cultural, technological and economic context, have given rise to unique challenges, rendering social resilience difficult to achieve in the urban settings of the Middle East in general, and in the UAE in particular. Dubai's authorities have recognised local vulnerabilities, and have employed innovative technological approaches that go beyond typical urban resilience frameworks. However, they face difficulties in ensuring that the stakeholders share a common vision and goals, which substantiates the importance of understanding how different Dubai crisis experts perceive social resilience. Based on interviews with local crisis management experts, the study illustrates that there are diverging views between city officials and first responders, relating to resourcing, accessibility, efficiency, with community engagement being almost entirely disregarded. It argues for increased community participation in building and maintaining urban resilience, which can be achieved primarily through better public communication and improved interoperability between the different stakeholders. This can also help bridge their differing perceptions in other aspects of resilience building, directly or indirectly associated with social resilience, from technological to political and economic.

Thus, this paper seeks to ascertain the extent to which current resilience-building initiatives employed by the Dubai Municipality can enhance the progress towards sustainable development goals and efficient crisis management, by examining the various perceptions of Emirati resilience experts. To achieve this goal, the paper identifies the vulnerabilities and opportunities characterising Dubai's unique context, while also critically analysing the initiatives aimed at strengthening Dubai's urban resilience, crisis management and sustainable development, through practitioners' and officials' perspectives.

THEORETICAL BACKGROUND

Crisis management provides the tools to identify and manage a wide array of potentially dangerous system failures.[1] However, each crisis is affected by a unique combination of social, economic, technological, legal, political or environmental factors, thus there is no universally applicable solution for responding to crises.[2] Instead, each actor or entity needs to develop a unique strategy for preventing, responding to and recovering from a crisis, based on the potential risks, known vulnerabilities and available resources, with the overall goal being to be able to identify and mitigate

incidents accordingly.[3] With this in mind, resilience refers to the ability of a natural or man-made system to absorb and bounce back from a disruption.[4] In the context of this paper, community resilience seeks to ensure that an entire community is capable of utilising the available resources, be them physical or psychological, to withstand a major event such as a crisis, regardless of type, scale and severity.[5] Closely tied to this is sustainable development, or the practice of seeking progress within a community in a manner that both fulfils the current demands of said community while also accommodating for the future needs of generations to come.[6] Therefore, if a crisis is poorly managed, it may result in the potential endangerment of the pool of available resources or of the integrity of the habitat, to the point where the living conditions of a community or country are compromised.[7] Under such circumstances, devoting efforts towards the development of sustainable and resilient solutions is a position that should be upheld by all the actors within a community, as a means of self-preservation. With this in mind, it is important to note that no major crises affected the United Arab Emirates (UAE) until the recent Covid-19 pandemic, yet it has been frequently affected by various natural crises of lower calibre, including earthquakes, landslides, floods, tropical storms and cyclones, sand storms, fogs, as well as potential tsunamis.[8] These, coupled with the rise of international terrorism and the exponential growth of its biggest cities in the past two decades, encouraged the creation of a dedicated organisation in 2007, respectively the National Emergency Crisis and Disasters Management Authority (NCEMA).[9] Currently, all disaster, crisis and emergency management institutions and services (including public, private and third sector) are centralised under NCEMA, which establishes frameworks and supervises the implementation of the legislation.[10] However, even now, key terms such as "disaster", "crisis" or "emergency" have not been featured at all in the Emirati Constitution, nor in any of the subsequent Amendments,[11] which may result in misunderstandings regarding the scale and impact of certain events. As one of the few Emirates to have its own crisis management governing body (i.e. Supreme Committee of Emergency, Crisis, and Disaster Management), Dubai has made great strides to address its distinctive context, for instance including such terminology in its local framework, and encouraging its experts to participate in continuous training.[12] Even so, the experts indicate that resilience and sustainability policies can and should be improved, especially since the Emirati government has made a commitment in 2015 to guaranteeing a sustainable standard of living for all residents, by pledging to adopt the United Nations Sustainable Development Goals (SDGs) throughout all Emirates, sectors, industries, and the entire community by 2050.[13]

METHODOLOGY
Data collection
The study makes use of qualitative primary data, which focuses on collecting and analysing individual perceptions, opinions, thoughts, feelings, behaviours and experiences.[14] This approach is particularly suited when considering the highly interpretative nature of resilience, vulnerability and sustainability, as these are social constructs that fluctuate depending on the societal perceptions regarding their meaning and scope.[15] In this case, the data was gathered via a series of semi-structured interviews, which allowed the researcher to personalise each encounter based on the participants' knowledge and willingness to elaborate on each topic.[16]

Sampling
The study required highly knowledgeable candidates who needed to be identified in advance due to their minimal representation in the general population, respectively Dubai-based crisis experts who were familiar with issues pertaining to resilience and sustainability. Given the specificity of the available population, the study employed non-probability, purposive sampling.[17]

The sample size consists of 25 experts (E), out of which 12 are Dubai city officials, and 13 are Dubai crisis responders, the goal being to gather opinions and experiences that encompass both theoretical and applied perspectives. Additionally, the candidates were selected from several organisations, to ensure a diverse and comprehensive depiction of the existing reality. The following roster emerged:

Dubai City Officials

- *Dubai Municipality*: E1, E2, E3
- *Digital Dubai*: E4, E5, E6, E7, E8
- *Department of Economic Development*: E9, E10
- *Department of Tourism and Commerce Marketing*: E11, 12

Dubai Crisis Responders

- *Dubai Civil Defence*: E13, E14, E15
- *Dubai Police*: E16, E17, E18, E19
- *Dubai Supreme Committee of Crisis and Disaster Management:* E20, E21, E22
- *NCEMA representatives in Dubai*: E23, E24, E25

Data analysis

Coding was used to analyse the primary qualitative data, namely repetitive pattern identification procedures were used to standardise the data, which provided a clear structure to the qualitative data that is typically unstructured and difficult to categorise.[18] A three-step coding process was followed, the analysis starting with open coding to first pinpoint the key ideas,[19] continuing with focused coding to group similar concepts,[20] and ending with theoretical coding to correlate the identified categories and to form new codes by identifying the relationships between the major categories.[21]

Results

The primary data analysis resulted in the extraction of unique codes and themes, reflecting the perspectives shared by the study's participants, as follows:

Code 1: Social Resilience
Sub-code 1 – Community Actions
Theme A: Education and Training
Theme B: Social Support
Sub-code 2 – Institutional Actions
Code 2: Economic Resilience
Code 3: Technological Resilience
Sub-code 3 – Inherent Urban Features
Sub-code 4 – Smart Features
Code 4: Environmental Resilience
Code 5: Political & Legal Resilience
Sub-code 5 – Legal Conditions
Sub-code 6 – Political Conditions

RESILIENCE, SUSTAINABILITY AND CRISIS MANAGEMENT IN DUBAI
Social resilience

Achieving social resilience in Dubai is dependent on various actions, taken either by the community at large (i.e. all stakeholders) or by the governmental institutional bodies, however the experts disagree on which actions should be taken. When referring to community actions, the participants identified two major themes, namely the importance of education and training for all crisis management professionals, as well as the necessity of social support policies for everyone.

There is a growing focus on the education and training of crisis management experts, and most participants agreed with this sentiment. However, differences between the perspectives shared by Dubai city officials and responders quickly became apparent, as the former group mostly lauded the existing professional development opportunities, while the latter were much more likely to criticise them. Indeed, the vast majority of city officials (i.e. 9 out of 12) expressed their content with the diverse curriculum and with the accessibility of specialised trainings to all practitioners. However, most of the responders (i.e. 8 out of 13) emphasised that although there are mandatory and optional learning opportunities available, pursuing continuous improvement remains challenging due to experts' limited time and budget – as the free, mandatory trainings are not exhaustive, while the optional ones are conducted by private companies, and therefore highly costly. The investigation also highlighted that while experts can engage in various theoretical courses and practical exercises, these mainly cover disaster, crisis, and emergency management practices, while the current training options for enhancing cyber-security are inadequate. This is a particularly concerning issue, considering that Dubai professionals are more likely to operate with vulnerable smart systems that are susceptible to cyber-attacks, and yet according to the local responders, many experts (including policymakers) are still oblivious to such risks.

Furthermore, participants explained that several governmental initiatives guarantee social support, and most interviewed experts commended the Emirati government for its commitment to enhancing community preparedness through numerous awareness campaigns and well-being initiatives, including the Happiness Agenda. However, such initiatives particularly target Emirati citizens, thus significantly less attention is dedicated to the wellbeing of the local migrant population, particularly expats and, to a lesser extent, tourists. Considering that the overwhelming population of Dubai is comprised of expats, some experts, such as E11, believe "[their] voices are neglected and [their] needs remain largely unmet", leaving non-Emirati citizens particularly vulnerable, and thus susceptible to the negative impacts of a crisis. Some participants also pointed out that, even for the Emirati citizens, the social support mainly refers to financial benefits, as the social stigma surrounding mental health persists to this day in the UAE, even in Dubai. Thus, according to E17, "many people who could benefit from free professional psychological support after a traumatic incident, choose not to go because they are afraid of what others will think of them". According to the experts, these issues pose genuine threats to the overall social resilience of Dubai, thus the policymakers should urgently address these deficiencies in the near future.

Even so, social resilience cannot be explored properly without investigating its other inter-connected aspects; notably the context-specific economic, technological, environmental, political and legal resilience all either directly or indirectly impact the stability, safety and security of the social capital. This dependence illustrates the interconnectedness of the stakeholders' resilience in general, as well as the difficulty in achieving it – what is interesting is that as will be demonstrated, participants' opinions on other resilience aspects are either more uniform than for social resilience, or not divided across the city official/crisis responder line.

Economic resilience

The participants praised Dubai economic resilience for maintaining a continuous focus on ensuring the long-term security of its reserves and its citizens' ability to financially recover from potential incidents. Moreover, they acknowledged that the Emirate is generally financially stable, although some pointed out that its reliance on oil and tourism could pose a threat to this stability. Nevertheless, most experts (i.e. 23 out of 25) acknowledged Dubai's competent leadership, evident in its swift response to the first large-scale crisis, namely at the onset of the Covid-19 pandemic, when the implementation of travel restrictions and fines demonstrated the leadership's ability to identify and

address crises promptly. Still, some participants (i.e. 12 out of 25) stressed that an essential aspect of achieving economic resilience lies in strengthening a community's social capital (and thus social resilience), as responders who had to continue working physically during the pandemic criticised the increased workload and health risks they faced while being exposed to other citizens. They also highlighted other socio-economic factors that emerged due to the regulations, such as rising unemployment rates, as according to some experts (i.e. E2, E9, E12, E20, E23), numerous companies shut down or suspended operations. Some participants noted, for instance, that the crisis "strengthened strategic relationships with local NGOs" (according to E25), emphasising the importance of "maintaining these collaborative efforts indefinitely" (as stated by E1), as a means of addressing existing social vulnerabilities.

Technological resilience

When discussing technological resilience, the participants' responses highlighted the need for Dubai to prioritise enhancing its inherent urban features over its smart initiatives, as the latter were widely considered to be successful (according to 22 out of 25 experts). Concerning the former aspect, the most significant vulnerabilities to resilience and sustainability lie on the one hand with the current legislation (mentioned by 9 out of 25 participants), and on the other with the existing structures (discussed by 13 experts). To elaborate, many buildings lack green energy-saving solutions and renewable energy sources, which according to the participants, could "significantly alleviate the strain on the energy grid" (noted by E23) and "mitigate the urban heat island effect" (mentioned by E21). Moreover, some responders pointed out that older buildings are not resilient to certain disasters such as earthquakes or fires, due to "lax legislation" (E13), "insufficient manpower" (E14) and "inadequate oversight" (E15). Limited communication between different agencies was cited as a potential reason for the lack of attention to these vulnerabilities. Regarding Dubai's smart features, participants expressed pride in the Emirate's receptiveness to adopting new and advanced technologies across various sectors, including education, healthcare, administration, safety and security, industry, travel and transportation, environment, economy and social aspects. Most notably, all 25 participants lauded Dubai's dedication towards open communication, and the progressive approach to migrate all public services online. While the system is not perfect, Dubai continuously endeavours to implement smart solutions that enhance the resilience and sustainability of the community.

Environmental resilience

Concerning Dubai's environmental resilience, interviewees agreed that the Emirate is closely aligning with the UAE's Energy Strategy 2050, which aims to reduce its reliance on fossil fuels and promote the adoption of green and renewable energy sources.[22] However, the transition is happening gradually, and as E15 emphasised there is a "considerable need for retrofitting buildings to align with changing threats" – notably referring to the use of flammable materials in cladding and to the fact that smaller buildings do not have to adhere to earthquake safety regulations. Furthermore, most participants from both groups (i.e. 20 out of 25) lauded the city's recycling policies and practices, as well as the more recent initiatives to protect both land and water habitats, with the Emirate of Dubai designating many local habitats as national parks protected by law, as part of the Sustainable Wildlife Initiative. This seems to indicate that the urban environment is lagging behind the natural one. Additionally, 9 out of 25 interviewees argued that relying to a large degree on solar power is opportune, however it presents challenges due to frequent sandstorms, which can cause significant damage to the panels, and this is of particular relevance when considering the ongoing desertification of the country. For this reason, participants considered the benefits of diversifying energy sources, with 14 experts considering the switch to nuclear, 9 participants suggesting an increase in hydropower, 5 experts mentioning

hydrogen plants and another 2 praising the recently opened waste to energy power plants. Even so, 7 of them pointed out that Dubai is still facing water management, pollution and sewage problems, which will only increase, given Dubai's popularity among foreign tourists, and which according to them need to be addressed as quickly as possible.

Political & Legal resilience

The participants expressed their belief that Dubai exhibits a considerable degree of resilience both legally and politically, though some acknowledged room for improvement, particularly in legislation. However, few specific suggestions were put forward to address the identified limitations. Some experts expressed dissatisfaction with the existing cyber-security protocols, while others criticised the limited monitoring and evaluation laws concerning the applied procedures and standards for physical assets (i.e. a total of 10 participants). A point of contention was the perceived lack of sufficient official documentation, which, in the view of E22 and E24, should include more "comprehensive definitions", "risk classifications" and "more detailed frameworks" for addressing "more specific risks and hazards". While a few experts pointed out bureaucratic challenges within the public administration, which to an extent hinder the adoption of smart and resilient practices, the general consensus was that Dubai has demonstrated decisive local action in aligning with the UN SDGs as a national strategy (according to 21 out of 25 participants). The interviewed experts agreed that the city is at the forefront of numerous sustainability efforts, and that a significant majority of the SDGs are officially addressed. The experts noted that certain SDGs, such as education and infrastructure development, were achieved prior to their formal adoption, thanks to the visionary leadership of His Highness Sheikh Mohammed Bin Rashid AlMaktoum. However, participants acknowledged that changing social policies posed more significant challenges, and it was understandable that progress in this area might take longer.

CONCLUSION

The resilience-building strategy of Dubai has progressed substantially in the past two decades, however, there is a lack of consensus between local crisis experts and policy-makers, who disagree on the methods of achieving lasting progress. Without a clear vision and strict guidelines, concepts such as resilience and sustainability are interpreted differently by individual actors, especially when applied to ambiguous settings such as the social context. Given the limited standardisation, especially when taking into account the UAE's adoption of and adherence to the UN SDGs, future research on the topic should seek to develop a crisis management framework which focuses on resilience based on Dubai's needs, resources and vulnerabilities.

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URBAN IDENTITY IN POST-SOCIALIST DURRËS: THE ROLE OF URBAN LAYERS

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INTRODUCTION ON THE URBAN DEVELOPMENTS IN POST-SOCIALIST DURRËS CONTEXT AND ISSUE OF URBAN IDENTITY

The urban developments during the post-socialist period in Durres are associated with informal settlements mainly in the peripheral zones (especially in Spitallë and Kënetë areas) and construction of high-rise buildings in the city center. In fact, the phenomenon of informal urban developments in Durrës started after the fall of the communist regime, when due to cutbacks in state enterprises caused considerable loss of jobs and pushed many people started to migrate from North and East regions of Albania. Although the impact of migration cannot be neglected in the post-socialist period, according to Misja and Misja (2004)[1] the informal settlements happened due to lack of ability and ineffective urban administration at the national and local levels from 1992 to 2000. Being the main port-city of Albania and the second important city after Tirana, should also be considered as another aspect which made the city attractive to the developers and citizens who migrated there with the hope for a better future. The same can be said also for newcomers who bought houses at the city center, considering the city a good alternative to Tirana, that could offer an urban lifestyle at lower prices. These developments caused urban transformations in both physical and social aspects of the city.

The physical urban transformation of the post-socialist Durres consisted in informal settlements evolved at the expenses of the agricultural land in the peripheries, whereas in the city center is featured by mainly high-rise buildings that were constructed at the expenses of socialist period green public spaces. Because urban transformations in the periphery go beyond the scope of this study, we will focus on those related to the city center. Obviously the most attractive places for developers were areas close to city`s main square "Liria", the waterfront and "Taulantia" promenade, Aleksander Goga Street, "Dyrrah" Boulevard and especially the inclined terrain between waterfront and Royal Residence hill. Since the developers aimed for maximal financial profit, they have constructed high-rise buildings, without showing any mercy even to very historical zones of the city like the area near the Royal Villa, or the zone close to the Roman period Amphitheatre and in the inner parts of the neighborhoods in the old town.[2]

The most common form of agreement between the householders and developers was by unification to acquire the construction rights in exchange for flat agreements. Some of the most notable high-rise buildings constructed in the year 2000s were Fly Buildings, Sunrise residence, or Kastrati apartment building. In many cases bold patterned and high-rise apartment blocks are constructed in the inner city without any specific urban rule, and their construction permission were given with the so called "partial urban plans".[3]

Figure 1. Image from Post-socialist Durres Urban Context

This kind of planning tool has produced a hybrid urban tissue in the case of Durres, where in the historical town could be found large scale post-socialist period buildings, mid-rise modern socialist buildings and old detached houses belonging to the Ottoman Empire, Albanian Kingdom, or Italian Invasion periods (Figure 1). The scale and intensity of the post-socialist period constructions has overshone some of the most important historical landmarks of the city producing a disharmonic city image and causing a loss of its urban identity. Also, the construction of illegal detached houses (which in many cases were legalized later) in the vicinity to the historical monuments have had a negative impact on the visual image of the city and consequently to its urban identity.

On the other hand, apart from the physical transformation of the city, the social structure of the city was also subject of change. The migrating people that settled in the peripheries brought socio-cultural aspects of their life, impacting the city and in many aspects ruralizing it especially due to their daily activities. Although slowly these peripheral zones are physically urbanized since some infrastructure has been provided, still it cannot be said that the process is finalized due also to the legal issues in the "land ownership" law in Albania, which appear a problem still unsolved.[4] Furthermore, in the central areas newcoming families also settled in the high-rise apartment blocks. The number of high-rise apartment blocks in the city center is considerable compared to the overall stock, thus although we do not have a statistic for that, it should not be hard to assume that the social structure of the city center also has changed. On the other hand, due to socio-economic reasons many Durres autochthonous citizens have migrated to Western Europe, thus making city`s social structure even more mixed and hybrid.

Recently the general local urban plan of Durres (PPV) was only approved by the Albanian government in 2021, while the detailed local plans (PDV) has started to be approved after that the same in 2021.[5] Although being one of the most important cities in Albania, the approval of the urban development plans of Durres, compared to other Albanian cities is one of the latest to be conducted. Furthermore in 2022 the Albanian government signed and agreement with Dubai`s Emaar group to develop Durres Yacht and Marina project. This project which foresees the transformation the city`s waterfront and the port in the Mediterranean Sea`s largest marina, including construction of 12,000 luxury apartments, luxury hotels and a terminal for international cruise liners.[6]

Materials and Methods

In this urban context this study aimed to measure the identification of Durres citizens, by interviewing 210 dwellers. To have a representative interviewee sampling (taking into consideration the dynamic social structure of Durres) we selected dwellers that lived in housing constructed in three different political periods: pre-socialist, socialist and post-socialist. For a better understanding of these three periods, we briefly explain these periods in the below section. Furthermore, we conducted a morphological analysis of a selected central zone of Durres (Figure 2) which we thought to be the most representative in e terms of the city, where buildings from all three political periods were found. We asked three questions:

1. Do you identify yourself with the city of Durrës? (Yes/NO)
2. If yes, how? (Open Ended)
3. Which is the most important building related to the city of Durrës identity? (Open Ended)

Figure 2. Location of the Selected Zone within major Durres map (left) and (right) Selected Study Area

Urban Layer Analysis of Durres Historical Center

To achieve the goal of inquiring urban identity of Durrës the study provides a morphological analysis of a significant, central part of the city where there are presented three urban layers: pre-socialist, socialist and post-socialist.

Pre-socialist Urban Layer

The pre-socialist period urban layer in referred to the old part of the city which bears monuments from antiquity, including buildings from Ottoman, Albanian Kingdom, and the Italian invasion period. These buildings have distinguishable features as they are low-rise mainly and characterized by historical ornamental decorations. The buildings of this period are divided into two main categories residential and public.

The residential buildings include detached houses from Ottoman period and low-rise apartments from Kingdom and Italian invasion period. Especially the "Mercantile Street", contains buildings designed not only with Neo-Classical features, but in some cases Italian rationalist influence is present in those built after 1926.[7] While most low-rise apartment buildings are in good condition, the same cannot be said for private houses, that from our observation are mostly abandoned and in bad condition. Most of the buildings in the "Mercantile Street" are featured by public character and mainly for commercial activities that operate on the ground floors. The ground floors are designed with ornamented large windows and vaults, which in some cases work as tunnels to connect the inner neighborhood with the street.

Socialist Urban Layer

The socialist period urban layer consists of buildings that were constructed after WWII until the fall of the regime in 1990s. They are mainly low-rise apartment buildings, that were constructed to achieve a socialist lifestyle, which functioned based on the principles of equality and collectivism.[8] One of the strategies developed by the socialist regime was the construction by voluntary work, in which people from institutions worked after working hours to build these apartments, which in many cases resulted in low quality dwellings.

Another strategy employed in the 1970s was construction prefabricated mass housing, by importing the technology from China. The aim for this was to find effective and low-cost technology to provide homes for the socialist society. These buildings were built near "Pranvera", near "Liria Square", alongside "Dyrrah" Boulevard and in the area near the stadium where they can be found most.

The main features of socialist period buildings were their purist regular forms and reaching a height of up six floors. The entrance was mainly opened to the street, leading to the main staircase. The used plan scheme of apartment blocks was typical and was affirmed in the by the Labor Party leading cadres. The appearance of socialist period apartments blocks was modernist, however in some aspects it was also grey and monotonous.

Post-Socialist Urban Layer

The Post-Socialist urban layer consists of buildings that were built after the 1990s until nowadays. The change of regime had a strong impact on the overall architectural features of the city. The effect of freedom brought from democracy is reflected in the usage of freer and more dynamic forms in residential buildings. Although in some aspect the usurpation of public spaces for construction of high-rise buildings can be explained as a sort of "misunderstanding" of democracy. As such many buildings and their architectural language feature opened balconies and bold, large volumes. Furthermore, the architecture of this period buildings is very independent from each other. Related to the post-socialist period we recognize two main housing typologies which are high-rise apartment blocks and detached houses.

The high rise-buildings can be up to 15 stories high. They are located in the inner neighborhoods in both parts of "Mercantile Street" and also around "Liria Square" (Figure 3). Thus, while the first line buildings belong to the pre-socialist layer, in the second line high-rise apartment buildings are visible and, in some aspect, outshine the older ones.[9] They can also be found along "Dyrrah" Boulevard and near the train station. The ground floors are mainly used for commercial purposes while the upper floors are used for residential purposes. The presence of detached houses built during the post-socialist period apart from the peripheral zones is also seen in Durres` central zones as well. In some cases, due to the commoditization of space has led to the design of detached conceptualized in the logic of small apartments as their core is designed.
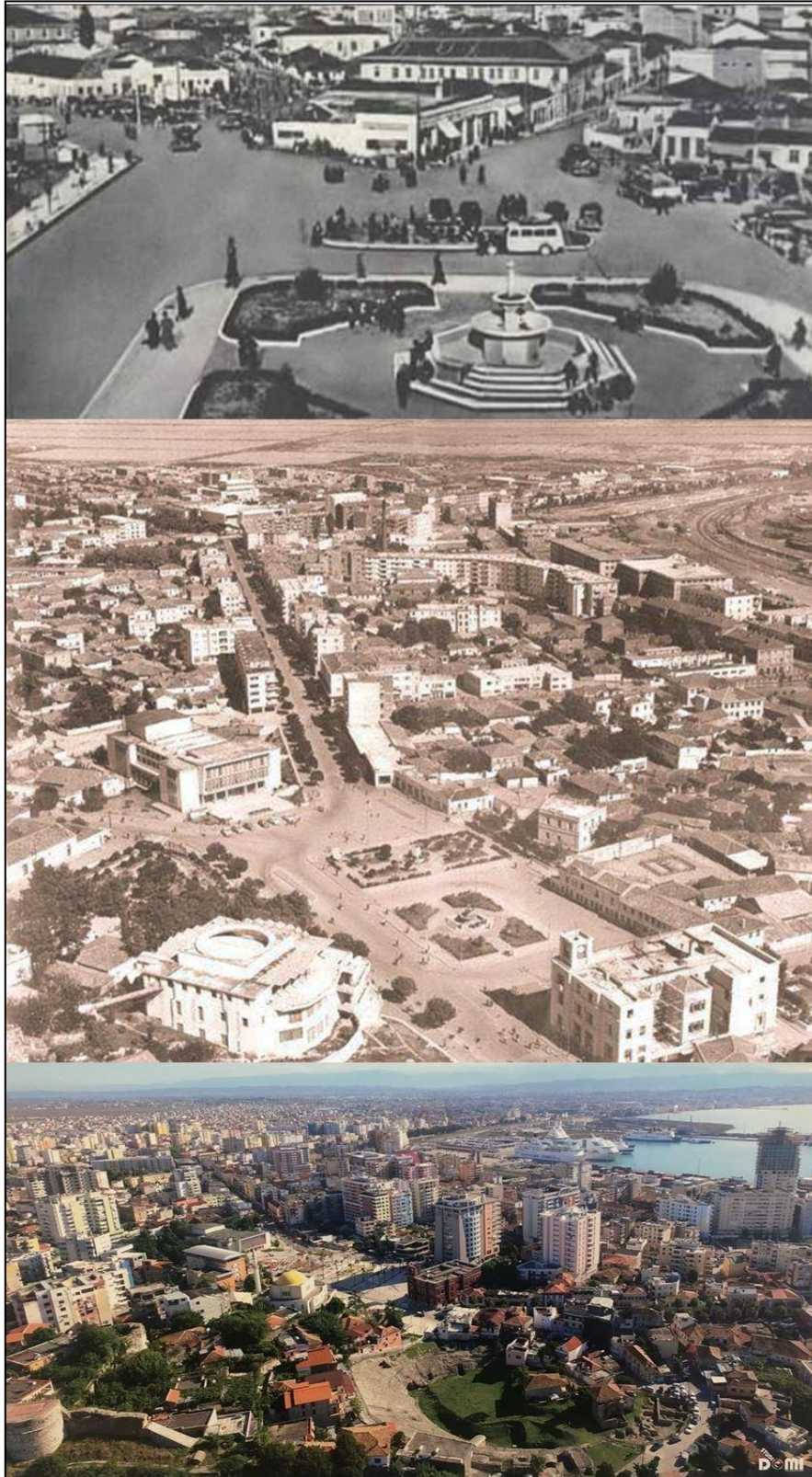
Figure 3. Images from pre-socialist (top), socialist (middle) and post-socialist period Durres (bottom)

Separately, allowing for easy distribution of upper floors for the family's children, which form a new family or for easy rental. Since these housing typologies are up to four floors high, their volumes do not provide a visual disturbance, when compared to high rise buildings.
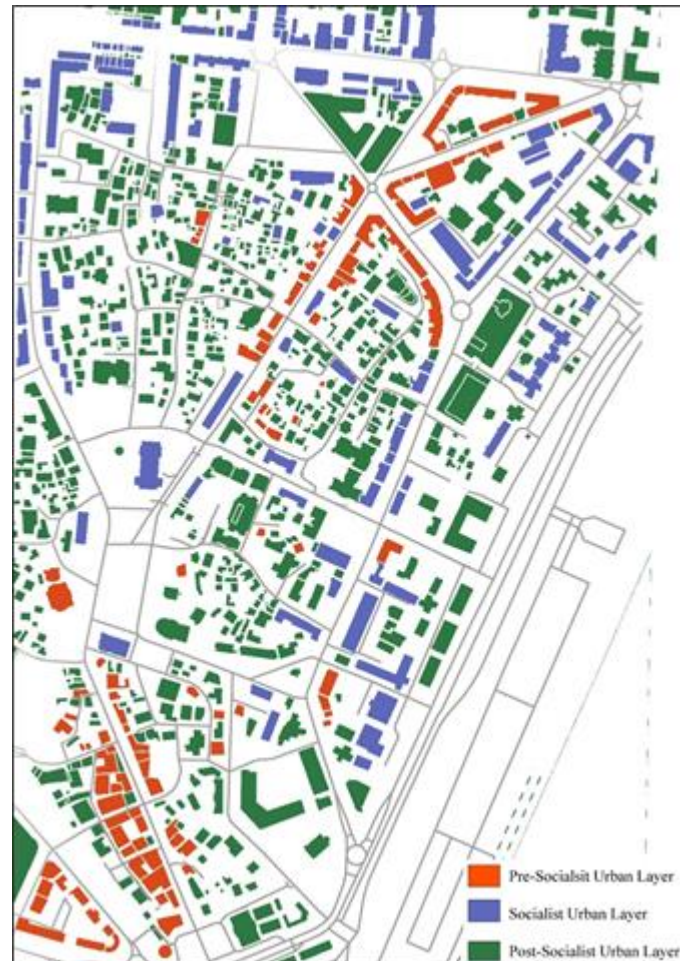
Figure 4. Urban Layer Analysis of the Selected Urban Area in Durres City Center (Courtesy of Julia Dizdari)

CITIES AND THEIR IDENTITIES

The research on city` identity started to gain importance due to the negative consequences of modernist doctrine in urban studies in 1960s, since many cities started to develop with same buildings[10]. This approach led to the creation of cities/towns with similar buildings, driving discussion on loss. of their identity. Thus, many scholar [11] investigated aspects of cities which can reveal their uniqueness like city image, townscape or "genius loci". Especially their developed theoretical discourse is used in certain urban contexts where the historical urban tissues or buildings are being damaged/transformed or in the cases of new cities which are designed aiming to establish a new identity.[12]

Place Identity

The concept of place identity evolves as a process of identification of certain people to a certain place or settlement. Identification of people with a certain place can happen into two forms.[13] The first one includes an identification to that happens due to a state of belonging to a group of people who are defined by location. An example of this one is being from Rome or New York. A second form of place identity is the one developed by Proshansky [14] in which the places` features are considered as part of substructure of self-identity like gender or social class and it includes perceptions and grasps regarding the environment. Furthermore,[15] these grasps are divided into two groups: i. those non-

tangible aspects related to place like memories, thoughts, or values; and ii. Those that are tangible and reflect different types of places like houses, neighborhood, or city.

Urban Identity

Building on Proshansky et al,[16] Lalli[17] developed the concept of urban identity in which the image of the urban settlement (town or city) is very important. The attributes which are necessary for self-differentiation are symbolized on an abstract level by special characteristics of the town. So, from here we extract that there are two important aspects that generate urban identity: the unique physical features and a bond which generate identification with the city. Although the same Lalli[18] divides the identificatory bond into four smaller clusters, since it exceeds our scope, we are not elaborating it further.

MEASURING URBAN IDENTITY

The results of the questions are provided at two levels: i. overall, which aims to have a more city-scale output; and ii. in the urban layer level aiming to understand their impact on urban identity. The overall view results show that a considerable majority of the interviewees identified with the city of Durres, in the post-socialist context.

Identification to Durres City Overall and According to Urban Layers

The overall results related to identification with Durres City show that predominantly the interviewed citizens identify with the city of Durres, although the post-socialist period context is associated with urban transformation featured by high-rise buildings at the expenses of green public spaces and historical urban pattern. As a matter of fact, 66.2% of the interviewees identified with the city, whereas 33.8% reported not to be identified with the city.
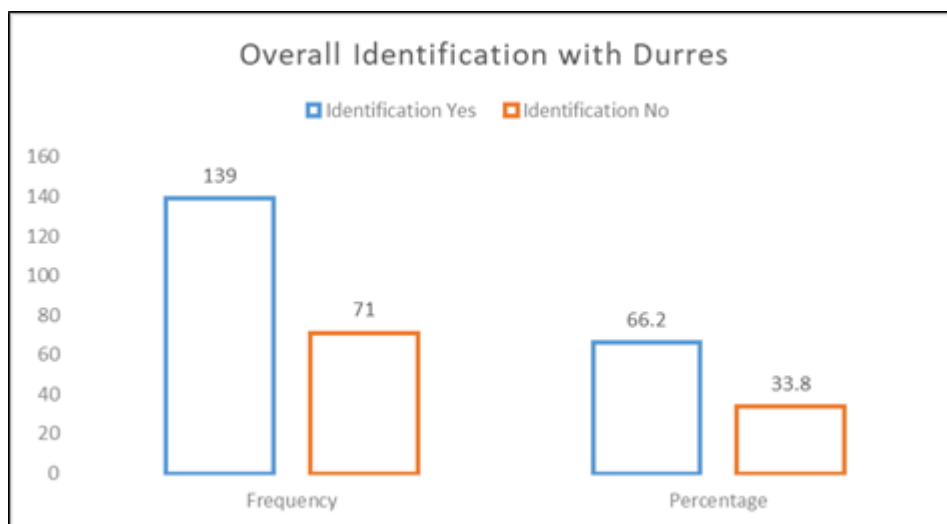
Figure 5. Overall View of Identification with Durres City

The results of identification with Durres City reported according to the dwellers who live in housing of different urban layers there is seen that identification is higher in older urban layers. As such the pre-socialist period urban layer inhabitant's percentage who are identified with the city is reported 81.4%, those of who lived in housing built during socialist period is reported as 65.7% and those of post-socialist layer is reported as 51.4%, which is quite balanced to those that do not identify.
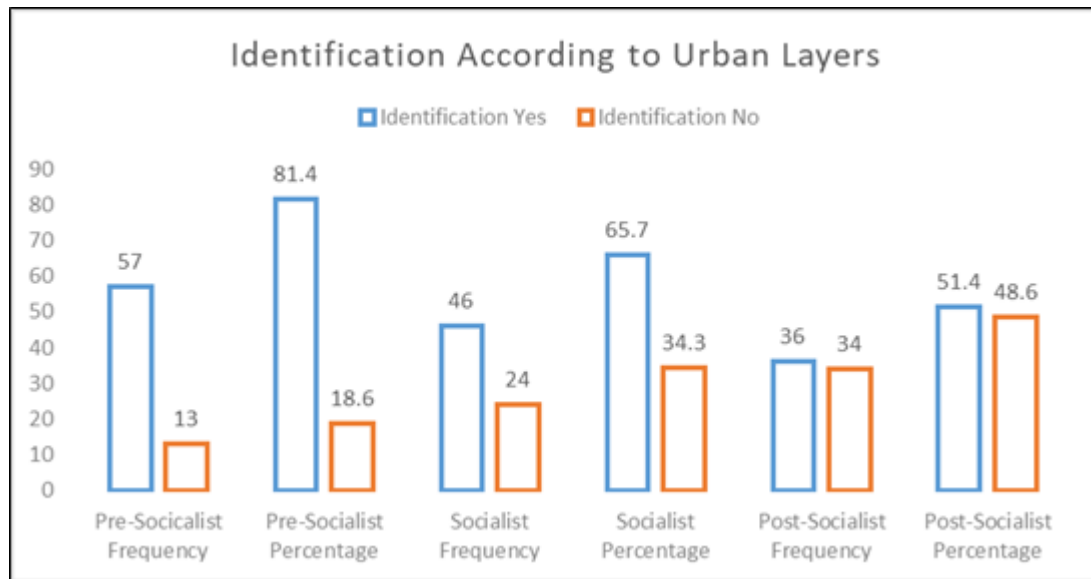
Figure 6. Identification with Durres city according to dwellers of different urban layers

The reasons for identification with Durres when analyzed can be grouped into built environment features, natural environment features and socio-economic-cultural factors. Obviously, the results reported by the dwellers of all three urban layers show the predominance of aspects related to identificatory relation as the main reasons for identification with Durres. The identificatory relation aspects are reported by 75.4 % of the identified interviewees of the pre-socialist urban layer, 82.6 % of the socialist urban layer dwellers and 63.9% of the post-socialist urban layer dwellers.
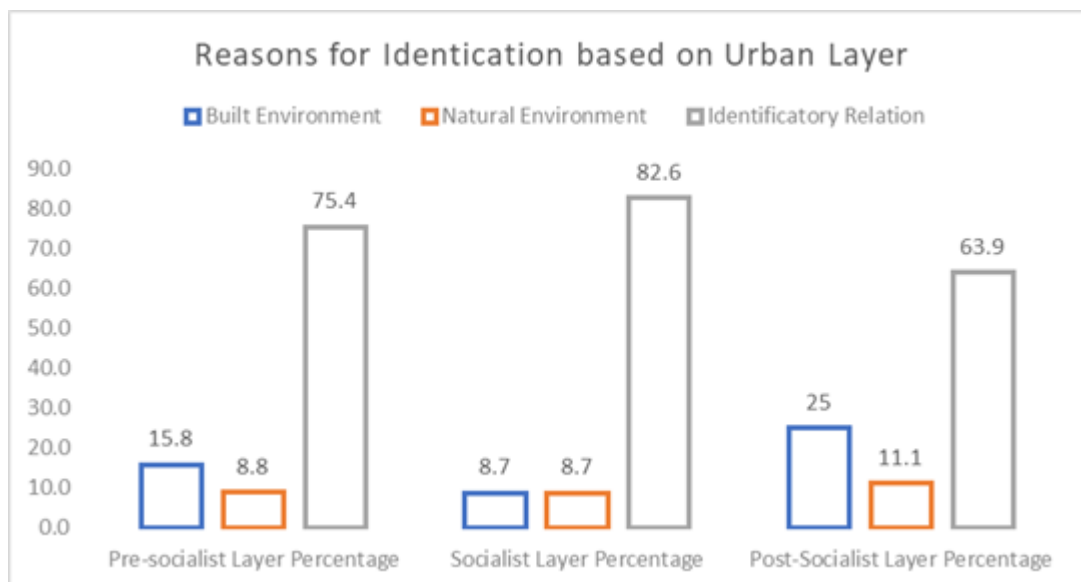
Figure 7. Reasons for Idenfitication with Durres based on Dweller`s Urban Layer

When the replies are seen as direct quotes in the case of pre-socialist layer dwellers the most reported one reflect aspects of an identificatory relation being born and raised to the city (18 people), followed by being citizens of Durres (8) or came at earlier age (7) or self-identifying aspects like origin (5). As for the built environment aspects as the main reason is reported old part of the city (8), while as the main reason related to natural environment is reported Adriatic Sea (5).

Identification- Yes			Identification- No
57			13
Form of Identification			
Built Environment	Natural Environment	Identificatory Relation	
9	5	43	
Buildings (2) Old part of the city (6) Costal city (1)	Sea (5)	Born and raised in the city (18) Citizens (8) Came to the city at an early age (7) Origin (5) Family (3) Work (2)	

Table 1. Reasons of Identification with Durres as reported by Pre-Socialist Urban Layer Dwellers

When the replies are seen as direct quotes in the case of socialist layer dwellers the most reported one reflect aspects of an identificatory relation related childhood memories (9 people) or being born in Durres (9 people), followed by due to history of Durres (3) or its culture (3). As for the built environment aspects, the main reason is reported their own house (2), while as the main reason related to natural environment is reported Adriatic Sea (4).

Identification- Yes			Identification- No
46			24
Form of Identification			
Built Environment	Natural Environment	Identificatory Relation	
4	4	38	
Their own house (2) Vollga Promenade (1) With every rock of the city (1)	Sea (4)	Childhood memories (9) Born (8) History (3) Culture (3) Work (2) The feeling of belonging (1) Raised in the city (1)	

Table 2. Reasons of Identification with Durres as reported by Socialist Urban Layer Dwellers

The replies in the form of direct quotes of post-socialist layer dwellers are seen as the most reported one reflect aspects of an identificatory relation related Durres culture (5 people) or being of Durres origin (5 people) and being born here (3) and followed by due to the Durres historical values (3). As for the built environment aspects, the main reason is reported the old historical part of the city (2), while as the main reason related to natural environment is reported Adriatic Sea (4).

Identification- Yes			Identification- No
36			34
Form of Identification			
Built Environment	Natural Environment	Identificatory Relation	
9	4	23	
Old part of the city (5) Their own house (2) Port (2)	Sea (4)	Culture (5) Origin (5) Historical values (4) Born (3) Memories (3) Duration (3)	

Table 3. Reasons of Identification with Durres as reported by Post-Socialist Urban Layer Dwellers

Landmarks as Identifying Physical Elements

When the interviewees were asked about which buildings were most important for Durres identity they reported as the most significant landmark the Roman period Amphitheatre with 37.6%. Other significant landmarks reported from the interviewees were Venetian Tower 17.6%, Royal Villa 10.5%, Municipality Building 7.6%, Old City Walls 3.3%, Archaeological Museum 2.4%, Bank Building 2.4%, Vollga Promenade 2.4% and Roman Forum, Port and Mosque which were each reported by 1.9 %.
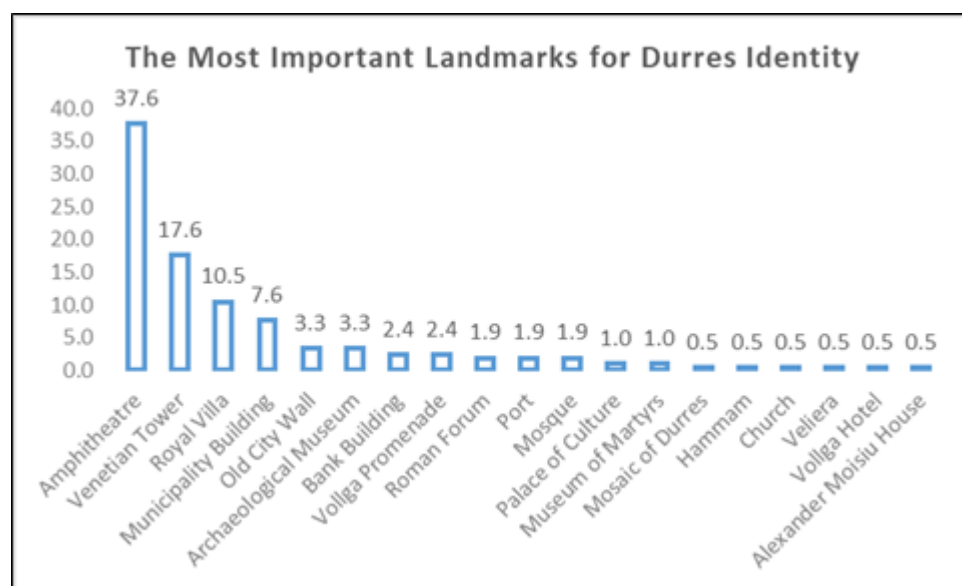
Figure 8. Overall View of the most Important Landmarks for Durres Identity

When the result of the most important landmark is evaluated according to the urban layers, it is seen that still Amphitheatre building is the predominantly reported in each of the layers. The highest result is reported by pre-socialist layer dwellers (29), followed by socialist layer dwellers (26) and the post-socialist one reported by 24 interviewees. Similarly in all the urban layers the second most reported landmark is considered the Venetian Tower. The highest value is reported by post-socialist urban layer dwellers (18 people) followed by pre-socialist (10) and socialist layer dwellers reported by 9.
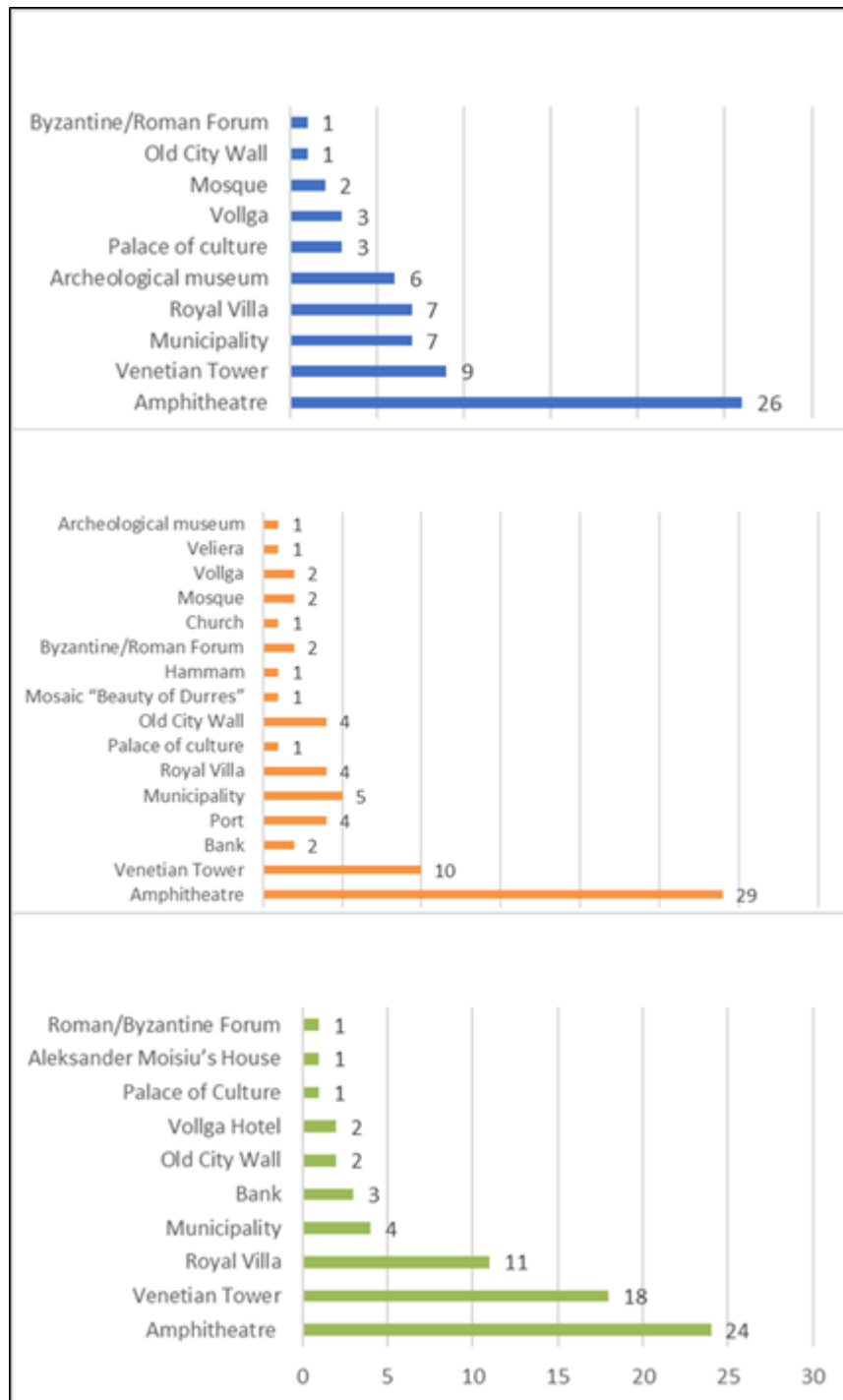
Figure 9. The most Important Landmarks for Durres Identity Reported Based on Urban Layer

CONCLUSION

This study focused on the issue of urban identity in post-socialist period Durrës, a city which has been subject of frenetic and dense informal urban developments. It utilized urban layers which are featured by different characteristics due to the different urbanization policies that were developed in each political period in Albania. Although Durres has been subject of quasi-uncontrolled urban development resulting in a sort of cacophonic built environment, the study found that most of the interviewed dwellers identify with the city of Durres. Furthermore, the sampling strategy by

interviewing citizens that are dwellers who live in housing belonging to different urban layers resulted to be meaningful. Based on that, it was found that citizens that dwellers of older urban layers have expressed higher values of identification. The most important reasons for identifications are clustered according to theoretical framework into physical aspect (further divided into built environment and natural environment) and identificatory relation. The predominant majority reported elements which are related to self-identification like being born in Durres, or it reminded their origin or their childhood. On the other hand, the most important natural environment aspect was reported on the Adriatic Sea, while as for the built environment was reported the historical old part of the city. Related to the buildings considered as the most significant landmark of Durres identity it was found that historical buildings remain the highly reported. The most important landmarks that represent the city identity are reported to be the Roman amphitheater, followed by Venetian Tower, Royal Villa, and the Municipality building. Interestingly the results evaluated according to urban layers do not show much difference.

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[6] The detailed project of Durres Yacht Marina is available at https://durresyachtsmarina.com/

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TOWARDS MORE INCLUSIVE DESIGN IN SHOPPING CENTRES: ENGAGING PEOPLE WITH LEARNING DISABILITY IN ARCHITECTURAL RESEARCH

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INTRODUCTION

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) 2006 aimed to *"…enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation …, and to other facilities and services open or provided to the public, both in urban and in rural areas."*[1] It stressed the equal quality of life and rights for people with all kinds of disabilities, which should be the goal of every state that ratified this convention. Disability is an umbrella term for impairments, activity limitations, and participation restrictions. This definition refers to the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and social).[2] According to the World Health Organization (WHO) *Global report on health equity for persons with disabilities*, there are more than one billion disabled people around the world, which counts for 16% of the global population,[3] of which 110–190 million adults are considered to have very significant difficulties in functioning, representing up to 3.8% of the world's population.[4] There are approximately 1.5 million People With Learning Disability (PWLD) in the United Kingdom (UK),[5] in Cardiff, there are 7,081 people aged eighteen and over who are estimated to have Learning Disability (LD).[6]

Learning disability is a reduced intellectual ability and difficulty with everyday activities, for example, household tasks, socialising, or managing money, and it affects the person for their whole life. Learning disability is associated with conditions such as Angelman syndrome, Asperger syndrome, Autism, Down syndrome, Fragile X, Pervasive Development Disorder, and Prada-Willi Syndrome, among others.[7] The limitations associated with LD may reduce a person's ability to both obtain and process information necessary for accessing, using, and enjoying buildings.[8] Hence building design needs to minimise the difficulties experienced by PWLD.[9] However, most architects, and their commissioning clients, create designs mainly for *normative* users.[10] Consequently, they create barriers that lead to the exclusion of many users.[11] When disabled people are considered in architectural design, they tend to be categorised as people with impaired mobility, a *disadvantage* typically mitigated by designing ramps and lifts without acknowledging other disabilities.[12]

This study aims to understand the accessibility needs of PWLD from their perspective – rather than relying upon the expertise of healthcare workers, vicariously lived experience, or designers' assumptions – in order to address a common absence of their voice in architectural research/practice. Through a participatory approach with PWLD as active participants using semi-structured walking interviews. The study was facilitated by a co-researcher with a LD to ensure the study's accessibility for the participants. The study aimed to 1) understand participants' perspectives on using buildings, 2) explore the barriers participants face in buildings, and 3) understand how PWLD perceive different architectural elements and spatial characteristics. This will contribute directly to the understanding of the accessibility needs of PWLD.

Problem

People with learning disabilities are often forgotten members of the community.[13] They usually get overlooked because little is known of their needs[14] since they appear to be less advantaged in many settings than those who experience physical or sensory impairments.[15] This situation either incorrectly assumes that existing regulations adequately fulfil the needs of PWLD[16] or indicates an insufficient understanding of their actual accessibility needs.[17] This has led to a multi-layered problem of the relationship between PWLD and the architecture industry, building regulations, and social perspective, which can be divided into three parts as follows:

The first part refers to the lack of self-advocacy due to the nature of LD historically. In the past, PWLD have been spoken of or to rather than spoken with; their voice has been marginalised. Varied ability to use common communication methods (for example phone, emails, and meetings) and to rapidly process information to express their views may have limited their opportunities to share opinions on building access issues. In contrast, people with physical impairment have historically been able to argue their rights about building access with successful results.[18]

The second part refers to the building codes, regulations, and standards. Due to the previously mentioned lack of effective communication, there is no mention of the accessibility needs of PWLDs in the codes.[19] Since the UK has ratified CRPD and its protocol[20] and has issued *The Disability Discrimination Act* (DDA) 1995, which is an Act of the Parliament of the United Kingdom (has now been repealed and replaced by the *Equality Act* 2010)*,* all its buildings need to be accessible for all disabled people equally. However, according to the House of Commons debate based on a written submission by the Access Association, *Access to and use of buildings: Approved Document M* did not reflect current best practices on inclusivity, and the current standard was *very light* on features for disabled people who do not have a physical impairment.[21] Hence, *accessibility* has largely been limited to removing barriers for wheelchair users, although less than 8% of the registered disabled in the UK are wheelchair users.[22] This leads to a non-critical shorthand of disability into a single identity associated with physical impairment by the architectural community.

The last part of the problem refers to the architects' attitude. Architects develop their professional attitude within the aforementioned societal and legislative context, often developing a limited gaze on disability as physical impairment to be *solved* by designing ramps and pavement curb cuts to comply with the established disability standards in order to avoid legal consequences for their clients and commissioners. Moreover, the clients and commissioners probably have different priorities: *"Sometimes some clients are interested in complying with good practices until they realise the relatively minor additional costs that this requires. Then they are only interested in meeting the minimum standards required."*[23] Furthermore, many who are charged with the responsibility of commissioning, designing, constructing and adapting the built environment do not have any knowledge about the needs of PWLD.[24] As a result, they create unintentional, non-visible, and

unknown barriers that hinder full community inclusion[25] due to the lack of feedback loop reaching back to those who shape the built environment, which this study attempted to create.

METHODOLGY

This paper reports from a participatory study which included semi-structured walking interviews alongside observations. As the LD community is often considered hard to reach, a collaboration was formed with a self-advocacy organisation run by and for PWLD in Cardiff, Wales. According to the special nature of the targeted audience and their vital role in the research, the organisation advised recruiting a co-researcher with an LD to support the fieldwork, as this will ensure a more inclusive environment for the participants. The co-researcher was recruited to ensure the accessibility of all the participant-facing material, facilitate the interviews and support recruiting. In addition, several facilitation techniques were used including cue cards, open questions, and Easy Read material (Easy Read is a format that was created to help PWLD understand information easily using pictures to support the meaning of text).[26]

Given that the study involved qualitative data and thematic analysis, the sample size depended on saturation. The research started with a small sample size of ten participants while the thematic analysis was conducted in parallel, the recruiting stopped at eighteen as there were no new emerging themes. The sampling technique used in this research was convenience sampling since the recruitment process occurred through the co-researcher and their organization.

PILOT STUDY

A pilot study was conducted to understand the buildings' preferences for the LD community in Cardiff to choose the case study. During this phase, each participant was asked a small set of questions about their buildings' preferences in Cardiff. Participants were asked to categorise the buildings into three categories, 'I like that', 'I do not like that', and 'I am not sure about that', using cue cards Figure 2. The results of this phase showed that 70% of the participants had positive comments on commercial buildings (shopping centres and retail stores), 65% had positive comments on restaurants and coffee shops, and 50% had positive comments on cultural buildings (historical buildings, museums, and theatres) and stadiums. While 60% had negative comments on community halls, and 50% had negative comments on educational buildings (schools, libraries, and universities).

Figure 2. Cue cards used in phase one, categorized into three categories by participant1
(left: "I don't like that", top right "I am not sure about that" and bottom right "I like that")

These results were discussed with the co-researcher and the organisation director, who confirmed that PWLD have a favourable attitude towards commercial buildings (shopping centres and retail stores) and restaurants and coffee shops. At that meeting, Cardiff Metropolitan Shopping Centre was chosen as a case study for multiple reasons. First, commercial buildings have the most positive comments among the participants, which meant that the walking interviews context is not a stressful location for the participants. Second, it is accessible location in the city centre where many of the charitable organisation's events take part. Third, its scale allowed the investigation of various architectural elements and spatial attributes, unlike a restaurant or a coffee shop. Fourth, it was convenient because there is no entry restriction, free to enter, and the research team and the participants could stay there as long as needed.

Shopping centres

Shopping centres have undoubtedly become essential components of modern living, serving as bustling centres of trade and socialisation, playing a vital role in urban spaces by facilitating commerce and connecting supply and demand.[27] They became indispensable in the urban landscape, providing much-needed spaces for leisure and socializing, with their spatial layout significantly influencing the overall shopping experience.[28]

However, it is crucial to acknowledge that this architectural environment has its critics. For instance, Rem Koolhaas formed the term *Junkspaces* to describe ubiquitous, homogenous, air-conditioned environments such[29] as airports, shopping centres and chain hotels. In his words, *'It is always interior, so extensive that you rarely perceive limits; it promotes disorientation by any means (mirror, polish, echo). ... Junkspace is sealed, held together not by structure but by skin, like a bubble.'[30]* Koolhaas' description of shopping centres suggests interiors deliberately designed with the intention of trapping the inhabitants in the space.[31] Indeed design strategies within the commercial retail sector are often predicated on creating *black-box* interiors that limit external stimuli (denying daylight and exterior views), and therefore reminders of, the outside world (typically through maze-like circulation and discrete, hard-to-find exit routes). Other authors have cited shopping centres as examples of *non-places*.[32] In many respects shopping centres are borne out of an architecture of default, largely driven

by speculative development and the demands of international retail consortia; their designers have limited scope for innovation and/or place-making.

To ensure that shopping centres remain vibrant and meaningful spaces, it is imperative to consider the diverse needs and preferences of individuals. Research highlights that people view shopping centres as more than just places for shopping; they value them for socializing and engaging in various activities,[33] which was clear in the pilot study. Therefore, shopping centre design needs to undergo a thorough revision, focusing on inclusivity and individual preferences, and, if possible, avoid the trappings of *Junkspaces* or *non-places*, while continuing to serve as lively social hubs for their users.

WALKING INTERVIEWS

A trial interview was undertaken with the co-researcher to ensure the accessibility and efficiency of the interview questions and exploring the centre. There are two versions of the interview questions: 1) for frequent visitors, who visit the centre once a month or more, and 2) for non-frequent visitors, who visit the centre less than once a month. As familiarity plays a role in how PWLD perceive and interact with buildings, based on the observations of the pilot study. Both versions have the same topics, in both scenarios, the questions are divided into two sections. First, those asked while walking around the centre, and second, post-walking **Figure 3** (a). Some of the questions were locational, others were activity-oriented using cue cards Figure 3 (b,c).
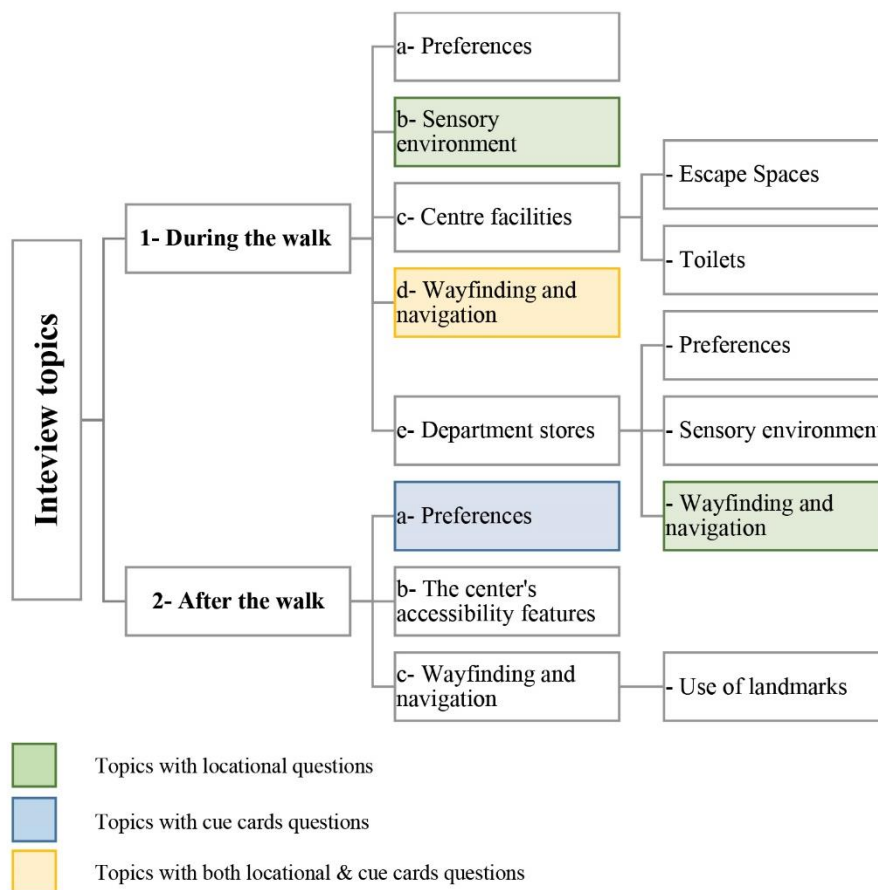
(a)

(b)   (c)

Figure 3. a) Walking interview topics Cue cards for the interviews. b) Cue cards for the interviews: random sample of the retail stores within the centre for wayfinding activities, c) Cue cards for the interviews: shopping places/space around Cardiff to prompt conversation around preferences

The walking interviews were transcribed with the observations and analysed thematically. The following table describes the barriers PWLD face in shopping centres, noting that the quotes/observations used in the table are samples, not an exhaustive list. These themes were discussed with the co-researcher and the organization director who both approved the findings. The themes are ordered according to popularity in **Table 4**.

1. Unfamiliarity

"They keep changing it, when I get used to it, they change it. They change it so much." P2.

"I am used to it." P3.

"Yes, because I live here, I know where they are, if I didn't live here, I wouldn't know where they are." P6.

Figure 4. One of the resting spaces chosen by the participants

2. Lack of escape spaces

"I can go somewhere, somewhere out or down at the library." P8 commenting on their coping mechanism with noise.

"I need some quite spaces." P13.

"Saturday nights, I wouldn't last more than 10 minutes." P14.

Figure 5. One of the resting places chosen by some of the participants

3. Centre Facilities

"My favourite is [a market in Cardiff] but I like [a closed shopping street in Cardiff] more because it has toilets." P1.

"One downside of [a shopping street in Cardiff] it can get crowded sometime … with arguments as will and people being ill, and it is not close for a para medic." P5.

Most of the participants (8 out of 10) who mentioned that they would ask for directions, said that they will ask a security staff not a random person.

Figure 6. The centre is covered by CCTV cameras

4. Lack of Options

"I prefer the escalators than the stairs, stairs can be hard sometimes." P2.

"I don't like the escalators coming down only escalators going up." P5.

"I prefer both the escalators and the lifts." P7.
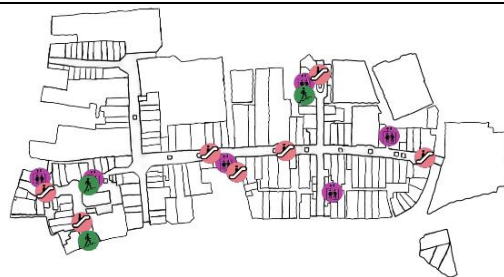
Figure 7. The centre ground floor has different vertical connection options

5. Wayfinding

"As I walk in [the centre's name] there is no sign in saying toilets or if they are, I find them small. As a whole it is not easy to find the toilets anywhere." P10

The co-researcher and P12 took the lift down, they were confused when to leave the lift, as there was only one sign with the floor number, and it was not visible from the lift they used.

Only five participants had the confidence to ask for directions during one of the activities.

Figure 8. One of the signs in the center

6. Crowds

"I don't like when it is crowded, no, and people walk into me." P14.

"It is a lot of people in here but that is one of my somethings I got to get used to because I freak out if it is too many around like today." P16.

"… I would say they need more room for people to manoeuvre and especially to stop other people from bumping into you." P17 advising designers for more accessible shopping centres for PWLD.

Figure 9. the centre gets busy in different seasons

7. Sensory Environment
a. Lighting

"Very bright, and glare and the ceiling is low here." [a comment while being in one of the shops Figure 10] P2.

"I don't like sometimes the bright lights on the shop titles." P5.

"Sometimes I find the lights a bit too bright." P14.

Figure 10. One of the shops in the centre

b. Colors and decorative featuers

"It is just too plain; I like the blue bit down there." P5 pointing at Figure 11.

"…there are bits, I want to say bland." P10.

All participants, when asked about Christmas decorations, said they liked it.

Figure 11. A preferred feature by one of the participants

Table 4. Walking interviews' themes

THEMATIC ANALYSIS

The data showed that various architectural features and spatial characteristics affect PWLD experience of buildings, either positively or negatively. Hence more consideration should be taken in order to design buildings that include them. The study identified seven key barriers: *Unfamiliarity, Lack of Escape Spaces, Centre Facilities, Lack of Options, Wayfinding, Crowds, and Sensory Environment*.

The first barrier *Unfamiliarity* emerged as a critical aspect for PWLD in shopping centres. They exhibited a preference for predictable spaces, such as chain coffee shops as it is predictable from the drink they will have to the interior design, colours, and overall atmosphere. Shops with stable merchandise layouts were also favoured, as it eased their navigation and search process. Understanding this need can guide designers to create spaces that provide a sense of predictability, hence, reducing stress levels for PWLD.

Similar to individuals with autism,[34] participants in the study identified a *Lack of Escape Spaces*. These spaces were associated with features like natural lighting, proximity to toilets, and interactive elements. Participants suggested that escape spaces could be as simple as benches or even outdoor areas. Integrating such spaces in shopping centres caters to the sensory needs of PWLD, providing a safe retreat when feeling overwhelmed.

In the third theme *Centre Facilities*, the participants valued the perceived *Safety* of shopping centres due to their relatively controlled environment. The presence of CCTV cameras and security personnel contributed to their preference for shopping centres over uncontrolled shopping streets. Essential facilities, such as accessible toilets and access to medical assistance and security staff, were also highly appreciated.

Another barrier is the *Lack of Options* which is essential for PWLD as they can choose what suits them best. For example, having choices in moving between different floors e.g., escalators, lifts, and

stairs, also having regular signs, interactive maps, and staff to ask. This can also be connected to the second barrier *Lack of Escape Spaces* in which the participants preferred different forms of escape spaces such as sensory rooms, quiet rooms, benches, or outdoor spaces.

The fifth barrier *Wayfinding,* emphasized the importance of effective wayfinding systems, as navigation proved challenging for PWLD. [35] Clear and prominent signage, including easy-read formats with large fonts and good colour contrast, were identified as vital aids. Interestingly, participants used prominent brand stores or their favourite shops as landmarks to aid wayfinding.

In the sixth barrier *Crowds,* the analysis revealed a preference for spacious and less crowded spaces among participants. To create such an environment, distinguishing entrances and exits and implementing a one-way system were suggested. Providing ample personal space addressed their need for comfort.

In the last barrier *Sensory Environment,* natural lighting emerged as a preferred feature among participants, aligning with their inclinations towards natural lighting in escape spaces. Additionally, positive responses towards *Colours and Decorative Features* were observed, despite conflicting design guidance for individuals with autism which generally promotes highly controlled environments with little sensory input, a low load of colour use, and high acoustical dampening. [36] Notably, an autistic participant -learning disability overlaps with autism among other conditions as mentioned earlier- showed a preference for more colours and decorations.

Engaging PWLD in architectural research revealed valuable insights into their needs and preferences, facilitating the creation of more inclusive environments. The identified barriers included *Unfamiliarity, Lack of Escape Spaces, Centre Facilities, Lack of Options, Wayfinding, Crowds, and Sensory Environment.* Overcoming these barriers in designing shopping centres fosters a welcoming and accommodating space, promoting inclusivity and enhancing the overall experience for PWLD. By striving for a balance between sensory considerations and individual preferences, architects can lead the way towards more inclusive design practices, ensuring that shopping centres become accessible and enjoyable spaces for everyone, regardless of their abilities.

CONCLUSION

This paper unveils the overlooked accessibility needs of PWLD through a participatory study. Surprisingly, the research reveals that shopping centres are the preferred buildings for PWLD, despite facing accessibility barriers. The current status of shopping centres as *Junkspaces* or *non-places*, along with their economic fragility due to e-commerce, necessitates a fresh perspective on their role. This status might need a revision from an alternative perspective, a perspective where shopping centres can be more than a shopping environment for users, which may result in questioning the past strategies on disorientation and *trapping* shoppers in space.

The study challenges the assumption that PWLD do not have specific accessibility requirements and provides an introduction to their needs in shopping centres. True inclusivity in design requires moving beyond designer's assumptions, PWLD, as true accessibility experts, bring invaluable perspectives and lived experiences to address barriers. Engaging them as accessibility partners/consultants is crucial to shaping architectural processes and products. Adopting a participatory approach fosters truly inclusive spaces that embrace the contributions of all individuals, irrespective of their abilities. By reimagining shopping centres and other environments, we can create more meaningful and accessible spaces for a diverse range of users.

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TOWARD SMART TRANSPORTATION: DOHA AS A CASE STUDY

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INTRODUCTION

Doha the capital city of Qatar experienced a transformational shift in the past two decades. This was as a consequence of diverse economic development, the hosting of international events, and rapid population growth. All of these circumstances generated serious traffic congestion due to the increase in the number of private cars.[1] Therefore, it was crucial to develop a smart Public Transportation (PT) system to comply with Qatar National Vision (QNV) 2030 and by implementing Transport Master Plan for Qatar (TMPQ) 2006-2026.[2] The TMPQ included the introduction of Doha metro, extensive expansion of the bus network, and infrastructure advancement. The prior public transportation system before the introduction of Doha metro has numerous deficiencies such as timetable reliability, fare and ticket integration, access to trip planning information, network coverage, and service frequency.

According to EU projects, integration of an urban PT system is defined as an organizational process that manages the different elements of the system (networks, infrastructure, fare and ticketing systems, information and marketing) so that they work together smoothly, resulting in efficient service and transport at both the public and individual levels.[3] Simply put, successful integration provides public transportation services that help users make door-to-door trips more easily, resulting in an increase in the proportion of people willing and able to use public transport.[4] Successfully applying the concept of transportation integration leads to reductions in environmental pollution, traffic congestion, and travel cost and time.[5] Commuter satisfaction can be achieved by providing a transit system that is simple in nature and has high standards of coordination, timetables that are coordinated in real time, highly frequent services, well-designed interchange points with pedestrian links, and a fair ticketing and fare system with easily accessed information. All the above can be obtained by adhering to specific criteria considering the following factors: institutional integration, service integration, network integration, physical integration, ticketing and fare Integration, and information system integration (Figure 12). Integrated public transportation system considering different criteria of integration minimize the walking/waiting time and guarantee an easier transfer between various modes of PT. This would result in minimizing the influence of outdoor thermal discomfort, which in case of Doha would be considered as an impediment to the success of this system.
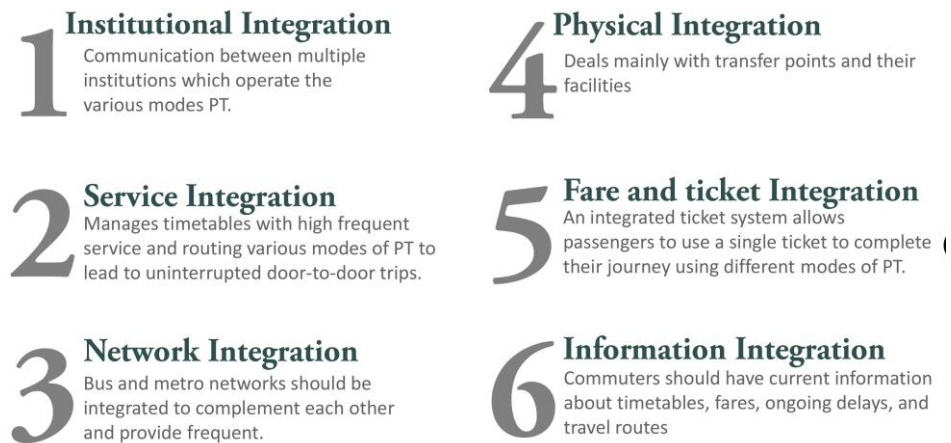
Figure 12. Criteria for achieving a well-integrated public transportation system (developed by author adopted from[6]).

Another important aspect that should be considered in the context of this study is smart transportation which is not only a crucial facet of our cities but is a key dimension in the management of a smart city.[7] The main idea of the smart cities concept is to bring different sectors together with the use of Information Communication Technology (ICT) to enhance a city's functionality and livability. Real-time information on mobile phones regarding users' locations and the location of nearby bus or taxi services can be provided using multiple smart transportation elements including GPS, monitoring cameras, the phone Call Detail Record (CDR), and traffic sensors. Moreover, the use of these smart transportation techniques can help city decision-makers to easily identify where people live and work and determine key characteristics of rush hour periods. Therefore, transportation solutions can be managed at much less cost and with greater efficiency than through older methods like surveys; data can be more easily obtained and is more accurate since it can be updated in real time.[8]

All the mentioned above literature highlights the major concepts that can be utilized in evaluating the public transportation system of Doha city. QNV 2030 aims to turn Qatar into a smart country sustaining smart transportation and this can be achieved if all PT systems are integrated together leading to more livable country. The objective of this paper is to examine the level of integration between the newly developed PT systems, and how this system developed over the past decade.

RESEARCH METHODS

In the context of examining the level of integration of the Doha public transportation system methods used by[9] was adopted. This research focuses primarily on three milestones of QTMP development, which is evaluated against specific criteria, specifically those concerning institutional, service, network, physical, ticketing/fare, and information technology integration.

To assess the level of integration of Doha city PT system, qualitative data was collected for three milestone time periods (2014, 2017, 2020). The data collection included face-to-face semi-structured interviews with civil engineers, road engineers, and urban planners in various governmental authorities: Ministry of Municipality (MME), Ministry of Transportation and Communication (MOTC), Public Work Authority (Ashghal), Qatar Rail, and Mowasalat. Adding to the oral data visual data was collected reviewing the maps of metro and bus systems. Finally site observation where a case study was selected to evaluate the level of integration on a typical case study (Figure 13)
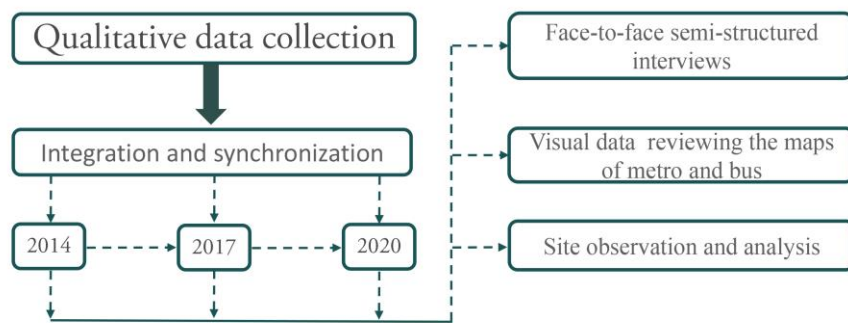
Figure 13. Logical flow of data collection (Source: Author).

At certain points, it was necessary to refer to a specific metro station as a case study, as part of understanding the overall system. To this end, the Al-Aziziyah (Villaggio Mall) metro station has been selected to serve as a case study for this research. This station has been so selected because its built environment has the same general characteristics as most of the planned metro stations in Doha; it is surrounded by mixed-use land with mostly residential development.
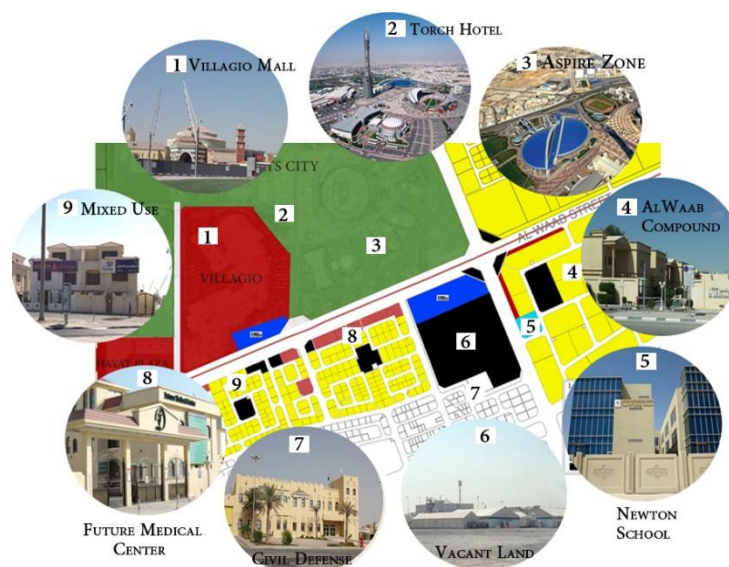
Figure 14. land use map highlighting the major surrounding Al-Aziziyah metro station area.[10]

FINDINGS AND DISCUSSION

This section covers the results obtained from interviews, visual data, and field surveys. It includes a description of three milestones of work and development to enhance the public transportation system. This research aims to answer the following question, what is the level of integration reflected in the metro and bus plans in Doha city?

Metro status and integration

To learn more about Doha's planned metro system, an interview was held with Mr.Shripad Korantak (Coordination Manager, Qatar Rail) he highlighted the physical and service integration and the use of smart city techniques. During the interview, Mr. Shripad elaborated that metro station locations were chosen by taking into account the high-density areas in central Doha and its outward extensions. The walking distance between stations and bus stop areas varies from a minimum of 20 meters to a

maximum of 70 meters, which ensures comfortable walking distances. Although efforts have been made to keep bus stops within 20 to 30 meters of metro stations, in a few cases there are physical constraints preventing this. For instance, at the Mall of Qatar station in Al-Riffaa, the walking distance between the mall and the station is around 100 to 150 meters; in this case, shaded air-conditioned pedestrian path is provided to PT users. The plans for the metro also aim for integration between the metro and bus systems by means of synchronized timetables. Mr. Shripad also noted that QNV 2030 aims to establish a world-class integrated transport system that adopts smart transportation techniques. These include the provision of mobile applications that lead to a high level of integration between the metro and bus systems and other means of transit.

A second interview then took place with Eng. Meerza Baig (Transport Integration Manager, Qatar Rail), explained the plans for system integration in more detail. He stated that there are three main levels of integration to be considered: physical, service, and ticketing/fares. To achieve physical integration, sets of drawings are prepared by the Qatar Rail organization; these illustrations are referred to as station area planning and are developed for each station. These plans show station entrances, catchment areas, surrounding land uses, adjacent metro stations, cycling and pedestrian routes, and bus routes. Station area planning thus illustrates how each metro station is designed to be integrated with other modes of transport, including private cars, taxis, and buses, and with cyclists and pedestrians. For service integration, the planned daily operational hours of the metro (21 hours from 6 am to 3 am) are divided into three time periods, each with a different frequency of service. During peak hours (8 - 9 am, 1 - 2 pm, and 5 - 6 pm) trains are running every three minutes, while for the night shift (after 10 pm) and remaining (off-peak) hours, train frequencies will be lower at eight and five minutes, respectively. All such frequencies and associated timetables are planned to be synchronized with the bus system. Finally, regarding fare and ticketing integration, this is considered having a single card that is valid for entire journeys, even if different modes of transit are used, as well as special discount groups including students offered.

As mentioned in the research method section, Al-Aziziyah metro station has been chosen as a case study to highlight the level of integration achieved at the level of station area planning. Regarding the physical integration three bus laybys, two bays for taxis, and two drop-off/pick-up bays for private cars are provided at each entrance of the station. All bus, taxi, and private car bays are located within 80 meters of the station entrance. In order to achieve service integration between bus and metro 13 bus routes serve Al-Aziziyah metro station. This station is supporting the use of bicycles as well where a shared pedestrian/cyclist area is provided immediately in front of the station entrances. There is already a bike path along Al-Waab Street, and this will be expanded in the future to provide a wider network for cyclists. Moreover, ten shaded parking spaces for bicycles are provided at all station entrances.
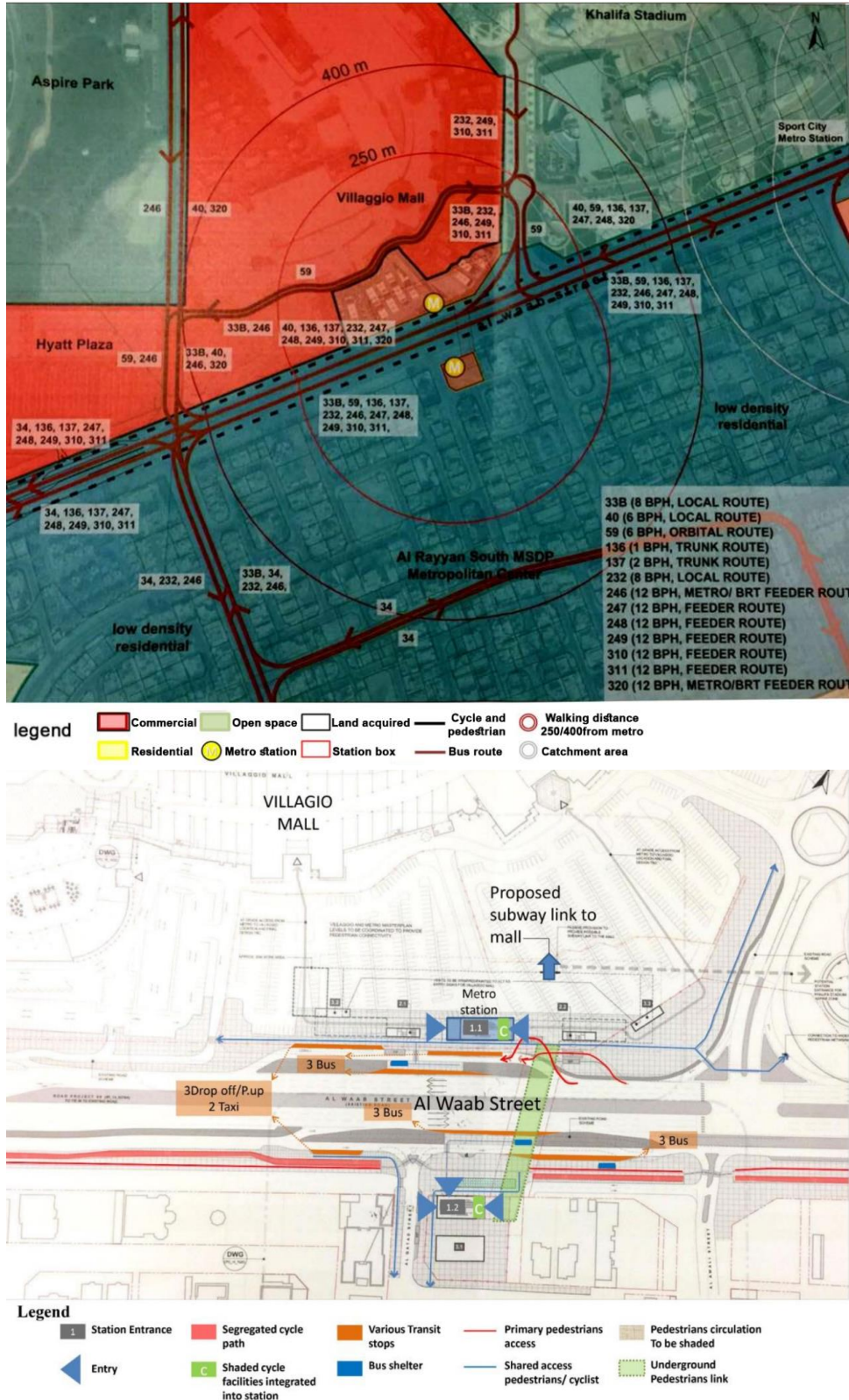
Figure 15. top Al-Aziziyah metro station highlighting 400m radius from the metro station and the 13 bus routes supports the metro station, bottom . Al-Aziziyah metro station entrances, bus shelters, pedestrians and cyclists path.[11]

Bus status and integration

Inadequate facilities at bus stop in industrial area

Only one bus stop in West Bay area with no shelter at5 this busy terminal

Bus stop immediately on car parking area in cor-niche

Old concrete shelter in madinat khalifa

Standard shaded bus stop

Air-conditioned shelter on
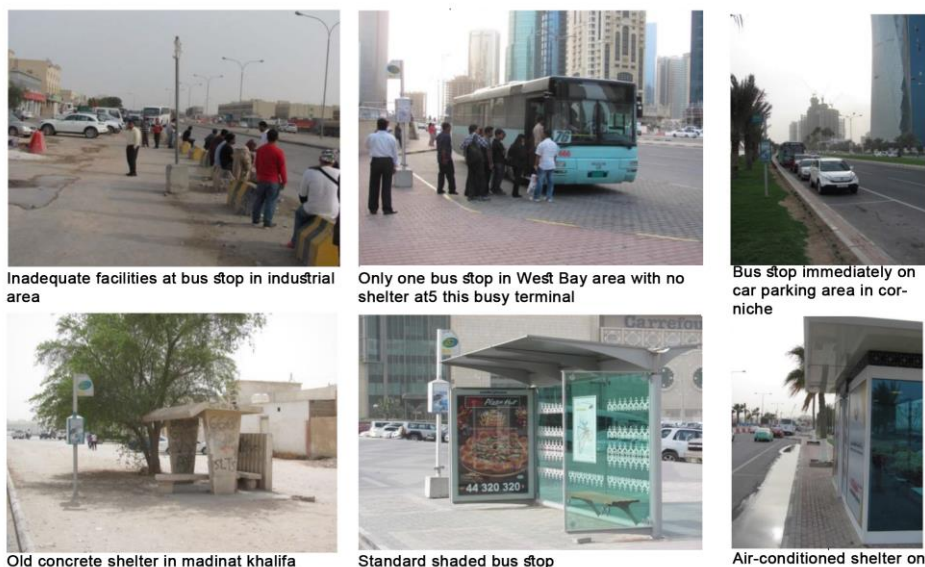
Figure 16. Illustration of different bus stop types and some relevant issues in 2013.

Figure 17. catchment area of bus network covering Doha city of 2020.[12]

The current bus system was largely put into place in 2013, when an interim bus action plan was developed. At that time, the bus system was suffering from multiple deficiencies. This includes the following:

• Poor network and service frequency: with 30-minute or greater waiting time, and indirect routes with long trips and unserved areas.

• Poor network coverage: significant employment and commercial destinations have poor network coverage and the pedestrian routing between bus stops and landmark buildings is not well designed.

• Poor bus infrastructure: poor sidewalks and pedestrian crossing, no modern bus shelters in Qatar (of 1300 bus stops, only 113 have shelters), and only one bus station (Al Ghanim).

• Poor passenger experience: unreliable service because of wide variation between published timetables and actual operation, and bus smartcards are sold in very few outlets, which usually run out of cards quickly.

Based on the mentioned deficiencies of the bus system, QIBAP 2014-2020 was developed to solve these issues, in three milestone periods (2014, 2017, and 2020). All of these proposals consider different levels of integration (institutional, physical, service, fare/ticketing, and informational) through multiple stages. In 2014, in accordance with QIBAP 2014-2020, 320 buses were added to the existing bus fleet, to achieve higher service frequencies on major trunk roads and serve the major communities in Qatar. This led to more frequent services, with 10 minutes' frequency during peak hours. Massive physical improvements to the system were also begun, including an additional 2300 bus stops and 1600 bus shelters (covering 70% of the bus stops). To meet increased demands for ticketing, more shops were added to meet the demand and information on the bus system website was updated.

In 2017, expansion plans call for a transition from a uni-centric to a poly-centric network focusing on key urban centers throughout Doha. This has been done by increasing 93 the number of buses in the fleet by 760 and further expanding the network. Higher service frequencies were provided on radial trunk routes, orbital routes, core city services, and airport express services, each requiring 20 buses per hour with more direct routes as well as feeder buses. Major infrastructure developments proposed in the 2017 plan call for three additional bus depots and suggest eight locations for additional bus stations, all of which is intended to deal with the increased size of the bus fleet.

In the 2020 proposal, the main objective is to restructure the bus network and services to support and integrate with Phase 1 of the Doha metro. Some express routes were eliminated because they were replaced with metro lines. Metro and bus services are integrated, and buses serve as feeder services to the metro, covering the areas around metro stations. The buses became running more frequently and the bus network were expanded further, reaching the extreme northern and southern parts of Doha. New metro park-and-ride sites were provided, and some locations previously used as bus park-and-ride sites will be converted into metro park-and-ride sites. The additional 2300 bus stops and 1600 bus shelters mentioned earlier is not only help meet increased PT demand but also help achieve physical integration of the components of Doha's PT system.
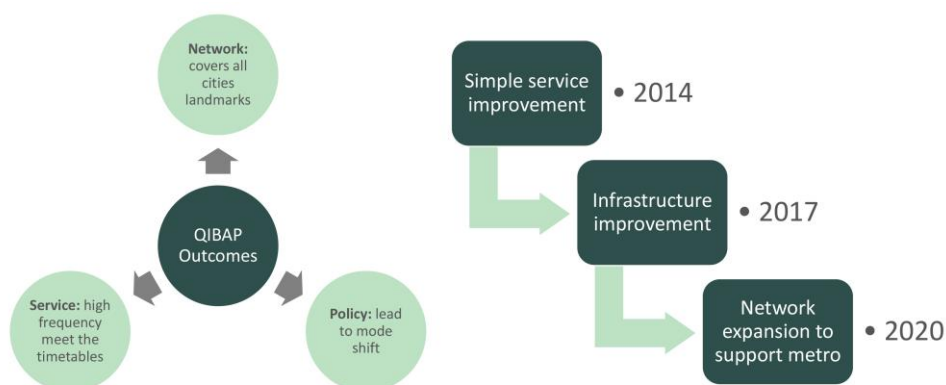
Figure 18. left the three main goals of QIBAP, three main millstones and their main theme(developed by author adopted from.[13]

Figure 19. summary of development of bus system in the three milestones higlighting different integration categories (developed by author adopted from.[14]

CONCLUSION

This research paper investigated the development of the public transportation system of Doha City from 2013 until 2020. The backbone of this system is the metro and is supported by the bus system. This paper was approached through interviews with key design professionals in Qatar and with a review of Qatar rail and QIBAP manuals, guidelines, and proposals. The success of this system is highly supported by the adoption of smart city techniques leading to more liveable city in terms of mobility. Both metro and bus systems were evaluated by studying the level of integration of each system and the following conclusions were drawn out with five aspects:

• Service integration: synchronized timetables between the metro and bus with high-frequency services leading to reduced waiting time (3 minutes service frequency) . Short walking distance between metro stations and bus stops (20-70) meters, meaning less than one minute of walking time.

• Network integration: this is achieved by having the metro act as the main system with buses acting as a feeder service. Where, the bus network is extended to cover new areas not covered by metro.

• Physical integration: all metro stations are located within major centers of activity, such as areas where many people work and/or live, and are supported by retail services, waiting areas, toilets, and ticketing and information services.

• Fare and ticket integration: by providing one ticket to be valid for different modes of public transport.

• Information integration: this is achieved in two different ways, traditional way, via printed brochures and on boards at metro stations and interchange points. the other way is through mobile applications and websites for trip planning(Figure 20).

As mentioned above the newly developed public transportation system of Doha achieved a high level of integration within a very short time period. Whereas, a massive effort has been done since 2013 to date to achieve world-class smart transportation system. However, this is cannot be achieved through a single action plan but rather it is a series of steps that each lead to a specific level of integration. In addition, it's not only about planning and strategies it's also related to people's attitudes which can't be predicted or controlled 100%, it's a process of trials and errors. This is very promising that this system will be flourishing in the next coming years.
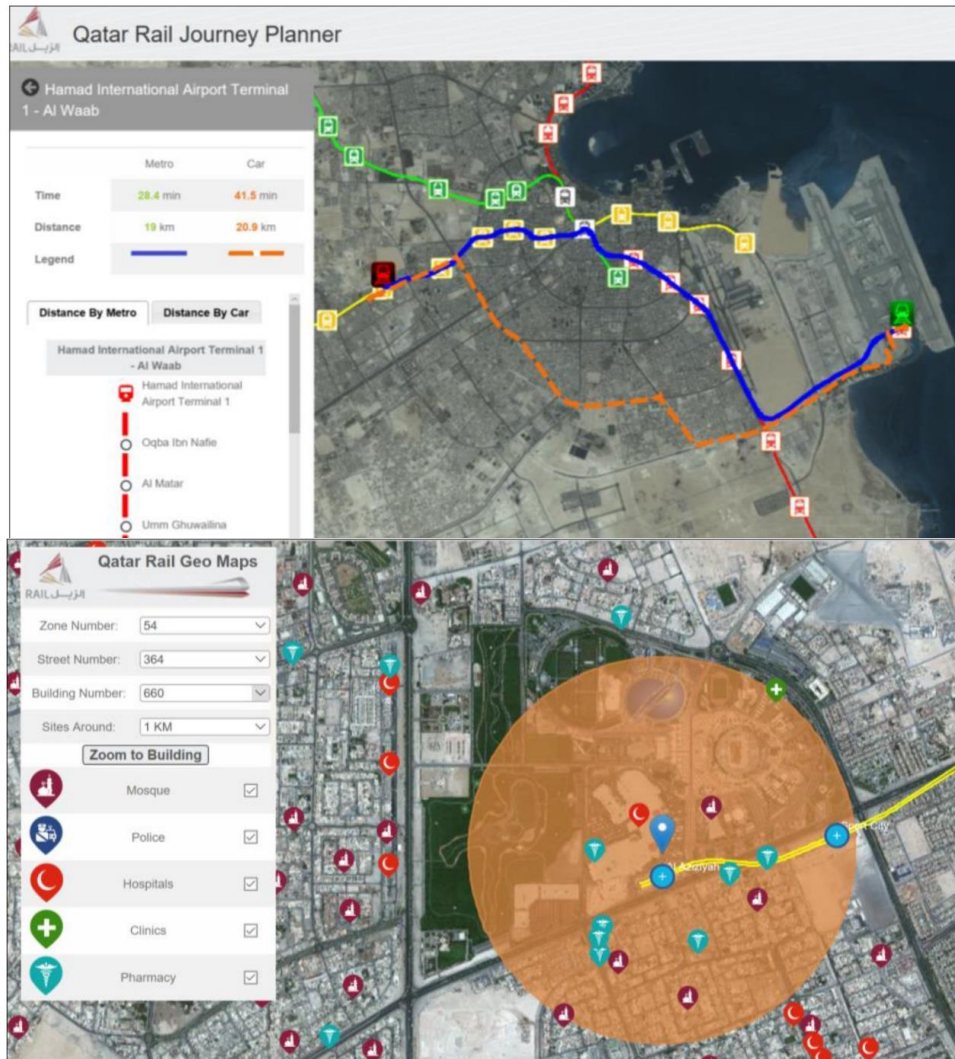
Figure 20. top Qatar Rail Journey Planner website,[15] bottom website of Qatar Rail Geo Map.[16]

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ORDER IN COMPLEX URBAN SYSTEMS

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INTRODUCTION

Mental images of the world provide cognitive anchors for observations, analyses, evaluations, and actions.[1] While stable, individual and collectively shared images change as knowledge is created. tested, and revised through experience. In the first half of the twentieth century, conceptual images of "the city" began to include infrastructure systems.[2] In the second half of that century, the city, itself, came to be understood by some as a system[3] or a system of systems.[4] Even when the word "system" was not used explicitly, this period saw increasing attention to relationships among the parts of a city and of parts to the whole.[5] In the early twenty-first century, insights gained through these perspectives led to what has been called a "science of cities."[6]

This paper extends the city-as-system line of inquiry by offering an approach to characterize kinds of system-wide order within urban areas. The aim is to help planners, designers, and stakeholders better understand contingent relationships within urban environments. A framework that was developed originally to describe structural features of a territory is adapted to characterize city functions and cross-functional relationships. The adapted framework is then extended to consider three kinds of city-as-system order. "Order from Above" comes about through issues related to power and access to shared resources. "Order from Below" comes about through issues related to exchange. "Order from Within" makes use of Information Communications Technology (ICT) and is increasingly important as cities become "smart" and augmented by algorithmic- or algorithmic-assisted decision making. These three kinds of order operate simultaneously, even if not equally, across a given area and at a given time.

THE CITY AS A SYSTEM

For this inquiry, a "city" is understood as having dense concentrations of people and buildings, heterogenous activities in proximity, and networks that allow flows (people materials, energy, and ideas) across and beyond its area.[7] The proposition that a city is a place "where strangers are likely to meet"[8] is also relevant for stressing the heterogeneity and loose interpersonal relationships within city populations.

A "system" is understood as a representation of a set of elements that interact with one another. That is, a system is not an "assemblage," *per se*, but a way to understand it. This point warrants emphasis. Thinking in terms of systems can be traced to scientific practices in the early Modern Age when attention turned to making sense of the observed patterns of organization and behaviour among parts within a whole. Examples of early recognized systems are moons orbiting a planet and planets orbiting the sun.[9] Perspective—both literal perspective and figurative perspective—matters when

thinking in terms of systems. Galileo needed a telescope as a tool to track the moons of Jupiter and, also, a way of perceiving the relationships among the celestial bodies. Perspective is informed by the questions asked about the assemblage. For example, an engineer might represent a building as a system of structural elements and fastenings; an occupant might represent a building as a system of rooms and doorways. Perspective in also informed by inferred cause-and-effect relationships based on observations. That is, systems thinking combines objective observation and subjective understanding.

A city-as-system is further qualified as being 1) *purposeful*, because it satisfies societal goals related to health, safety, and welfare, 2) *emergent*, because its behaviour cannot be reduced to the behaviour of its individual elements or sub-systems, 3) *complex*, because many, if not most, of its individual elements interact with multiple other elements, 4) *open*, because it exchanges information, energy, and materials with its surroundings, 5) *self-organizing*, because its internal structures or functions can be modified in response to external change, and 6) *non-intensive*, because the properties and behaviours of its parts change with the size of the whole. As a result of the combination of these qualities, questions about the dynamics of a city-as-system—that is, how interactions are enabled and managed across space and over time—come to the foreground.[10] In this light, the impact of an urban planning or design proposal is less about what may be built than how the proposed change will affect relationships with other elements and, perhaps, alter the functional capabilities and capacities of the system.

An additional qualification is that a city-as-system is a *coupled system* because it combines social systems and biophysical (or "Natural") systems. Increasingly, a city-as-system is a *trebled system* because it brings together social-, biophysical-, and cyber systems. Due to these aspects, a city-as-system has spatially- and temporally explicit relationships with its context and within its boundaries. An example is a watershed in which precipitation gathers and then flows through pipes, culverts, streams, and rivers. The notion of "shed" can be extended to all kinds of flows and services.

To define a systems-based image of the city, observable elements or variables that contribute to cities must be put forward. A way to define cause-and-effect relationships between or among the variables must also be offered. Doing so often involves managing ambiguities rooted in possible connections among the variables. Resolving such ambiguities is done by imposing a generalized framework on a problem.[11] While such a framework is used explicitly to manage epistemic concerns, it may—and likely will—implicitly also concern ontologic concerns, relating what is considered and not considered within the system, and moral concerns, relating to what is considered good and bad system performance. These aspects focus attention on subjective understanding when identifying a system.

The combined specifications of any system describe what is possible and not possible. With city-as-system models, they inform the ways, means, and ends of urban planning and design practices. The resulting "map" (system) should not be confused for the territory (the city) it represents. The often-noted adage, "All models are wrong, but some are useful"[12] is applicable. Further, it should be emphasized that even useful models are limited. When digital design tools started to become more widely available, architect and design theorist Christopher Alexander cautioned, "A City is not a Tree," referring to the tree-like decision structures of early computational models. That kind of model serves some purposes but failed Alexander's image of a city, because the logic of tree structures does not adequately represent the fullness of life lived in an urban area.[13]

THE PMESII FRAMEWORK AND ITS ADAPTATION TO URBAN SYSTEMS
The PMESII Framework

The generalized framework that will be used to advance an image of city-as-system is the Political, Military, Economic, Social, Infrastructure, and Information (PMESII) framework. It was developed by the United States Army to inventory components of operational environments at the geopolitical

unit of the nation state and was subsequently employed to understand environments writ large,[14] including urban environments.[15] In 2015, it was adapted for a NATO Urbanisation Project study to identify key questions about how cities around the world might change over the coming twenty to twenty-five years.[16] This investigation was one of many undertaken by scholars across Europe and North America to anticipate future conditions and inform capabilities that might be needed to respond to humanitarian and military crises in an increasingly urbanized world. Ten cities that represented a range of geographic locations, population sizes, demographic compositions, and levels of economic development were reviewed. Attention was given to most pressing and uncertain issues in each city as described and debated in government reports and news stories. While structural features within each city were identified in accordance with conventional PMESII methods, emphasis was placed on proposed policies and plans to better meet functional needs for each respective population. That is, during this review process, the standard PMESII prompts began to be reconsidered and reframed from asking "What…?" questions to asking "How…?" questions. Answering the "How…?" questions required inferring cause-and-effect relationships to link preferred means and desired ends.

Table 1 provides standard definitions of the six PMESII variables, which emphasize structural characteristics, and the adapted questions, which emphasize functional behaviours. In the adaptation for civilian planning and design considerations, the Military variable should be understood as considering security and safety capabilities and capacities, such as those provided by first responders. Since each question asks a question about function, answers will include spatiotemporal service-sheds. Examples include voting districts and election processes ("Political-sheds"), police districts ("Military-Security-sheds"), branch banks ("Economic-sheds"), parish churches ("Social-sheds"), drinking water distribution areas ("Infrastructure-sheds"), and media distribution areas ("Information-sheds").

Variable	Original Structural Defining Issue(s)	Revised Functional Question(s)
Political (P)	Describes the distribution of responsibility and power at all levels of governance	How is a member (typically a citizen) identified, what rights pertain to a member, and how do these rights differ from non-members?
Military [Security and Safety] (M)	Explores the military and/or paramilitary capabilities of all relevant actors (enemy, friendly, and neutral) in a selected operational environment	How are security issues defined, declared, engaged, and resolved?
Economic (E)	Encompasses individual and group behaviours related to producing, distributing, and consuming resources	How do people exchange goods and services?
Social (S)	Describes the cultural, religious, and ethnic composition	How do individuals and groups behave and what motivates them?
Infrastructure (Infra)	Portrays the basic facilities, services, and installations needed for the functioning of a community or society	How are flows – of people, food, water, goods, power – coordinated throughout the city?
Information (Info)	Depicts the nature, scope, and effects of individuals, organizations, and systems that collect, process, disseminate, or act on information	How is truth recognized?

Table 1. Definitions of PMESII variables (Source for Structural Defining Issues: US Army, Training Circular 7-102: Operational Environment and Army Learning, Washington, DC: Department of the Army, 2014; Source for Functional Questions: Author)

The PMESII Framework Category Pairs

The process to identify and characterize functions within the city-as-system is extended by identifying questions about interactions between pairs of the six PMESII variables. Doing so aids to the understanding of the image of the city as a system-of-systems by identifying interdependencies.[17] It also provides a way to stimulate consideration of second order (and perhaps third- and fourth order) effects of changes to the city. The Figure 1 illustrates the fifteen connections across the six variables. Each line is associated with its own question about a city-as-system function. The pair-wise questions, which are provided in Table 2.
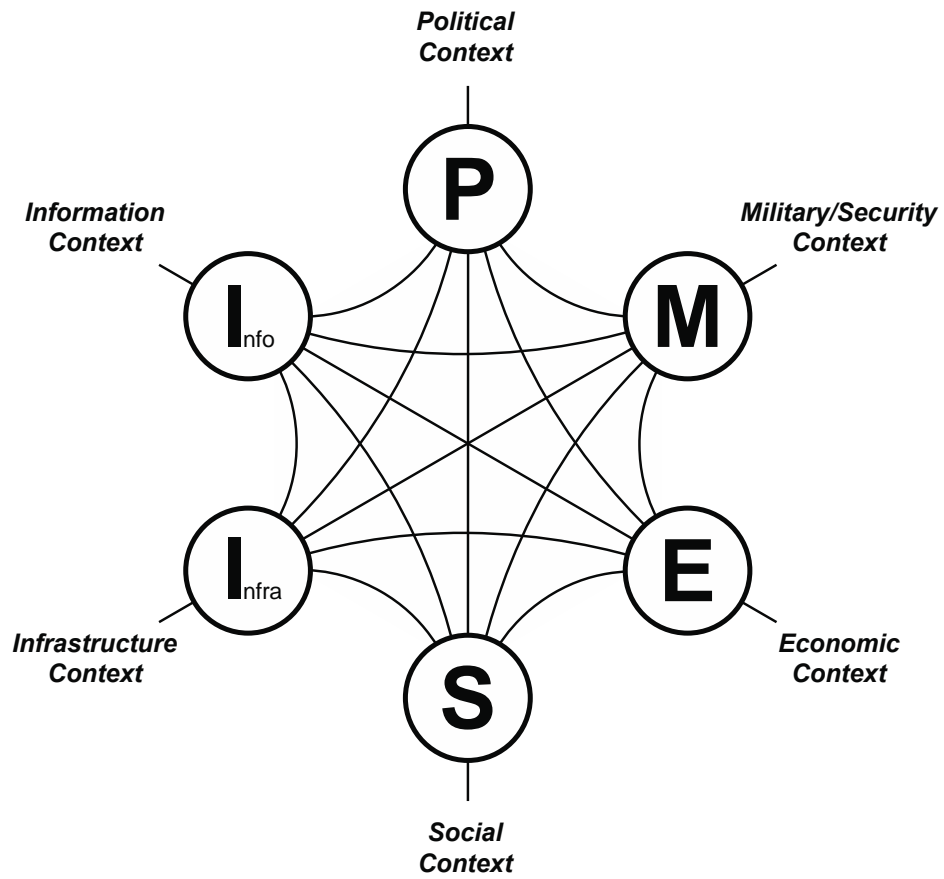
Figure 1. PMESII Variable Interactions (Source: Author)

Variable Pair Interactions	Defining Question
P – M	How are laws over a population administered and enforced?
P – E	How are regimes of resource distribution structured?
P – S	How is social order legitimized?
P – Infra	How does the state (or city) establish conduits and protocols to direct flows?
P – Info	What counts (that is, numerically matters) and how are counting (inventory systems constructed and used?
M – E	How are technologies for war and peace prioritized and changed from one to the other?
M – S	How do the institutions respectively associated with the "two hands on the sword" influence one another?
M – Infra	How is force expanded, extended, and delivered?
M – Info	How is situational awareness sensed and made sense of?
E – S	How do (social) interests get costed or priced?
E – Infra	How are general, basic services made sharable for specialized production and trade?
E – Info	How are opportunities for exchange revealed?
S – Infra	How do people extend their reach and expand their effect?
S – Info	How do people share individual perceptions (facts and opinions, aspirations, and fears) with one another and how do they make collectively shared perceptions?
Infra – Info	How are flows measured, managed, integrated (or separated), and synchronized?

Table 2. Definitions of functional relationships between pairs of PMESII variables (Source: Author)

PMESII Framework Triplets

Ordering Triplets

A second extension of the adapted PMESII framework identifies triplets comprised of questions from Table 2. It is posited that these combinations provide sources of order (or governing arrangements) to the city-as-system. An intellectual basis for considering the triplets follows from other three-term conceptual models to understand social systems. Perhaps the best known of these triplets among planners and designers are Lefebvre's ideation of social space as interactions among conceived-, perceived-, and lived space[18] and Soja's triplet of spatiality, historicality, and sociality.[19] The analytic and compositional benefit of using triplets is the way the approach calls attention to relationships with other factors. Each question in the triplet must be answered in relation to answers of the other two, so system stability is based on contingent associations of practices within constraints. Correspondingly, changing the conditions of any one answer within a triplet prompts consideration of changes to the other two answers. For the city-as-system PMESII triplets, a new policy, plan, or practice would

provide the basis for a new answer to a question. In most cases, the contingent quality of these triplets is not chaotic, but reflects routine and regular negotiations among stakeholders—the strangers who live among each other in the city—to provide for or improve health, safety, and welfare. An inability to resolve relationships among the triplet variables could, however, be indicative of system-wide instability and could even lead to what have been called "feral cities."[20]

Order From Above

"Order from Above" combines Political, Military (Security-Safety), and Infrastructure functional relationships. This triplet of paired variable questions is illustrated in Figure 2. It broadly concerns the prioritization, control of access, and the management of vital shared resources. Activities often large involve capital-intensive projects. Related notions of "top down" urban planning and design are well documented.[21] An example from ancient history is Athens, which in mid-fifth century BC had not only defensive walls around the city, but also its so-called Long Walls that connected supply routes to the ports of Piraeus and Phaleron.[22] An example from the nineteenth century is Hausmann's plan for Paris. It facilitated transportation and contributed to defense through straight and broad avenues with connections to railroad stations.[23] An example from the much more recent past that illustrates how intentions to manage some parts of a city by "Order from Above" can create vulnerabilities in others is New Orleans. Its levee system was breached during Hurricane Katrina and the flooding disproportionately harmed people in minority-dominant districts.[24]
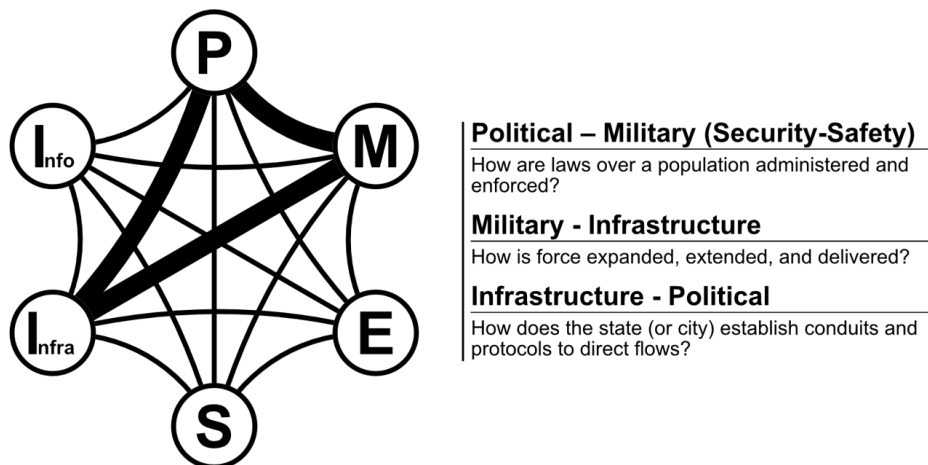
Figure 2. PMESII Order from Above (Source: Author)

Order From Below

"Order from Below" combines Economic, Social, and Information functional relationships. The triplet of paired variable questions is illustrated in Figure 3. It broadly concerns localized decision-making and (mostly) private exchanges among individuals and groups through market transactions. Activities are often relatively modest in scope but can have cumulative impacts. Related notions of "bottom up" planning and design are also well documented.[25] For example, Jacobs, motivated by personal experiences in the Greenwich Village area of New York, highlighted the roles of personal-level exchanges as the source of vibrant neighborhoods and urban districts.[26] Beyond the neighborhood-scale, the use of markets to allocate efficient patterns of land use has been extensively theorized and modeled.[27] Reallocations of space that follow from pursuits of private economic interests are not always without controversy and the can result in displacement from pressures of gentrification.[28] It

has also been shown that markets are not able to provide for shared resources such as road networks and open space.[29]

Economic – Social
How do (social) interests get costed or priced?

Social – Information
How do people share individual perceptions with one another and how do they make collectively shared perceptions?

Information – Economic
How are opportunities for exchange revealed?
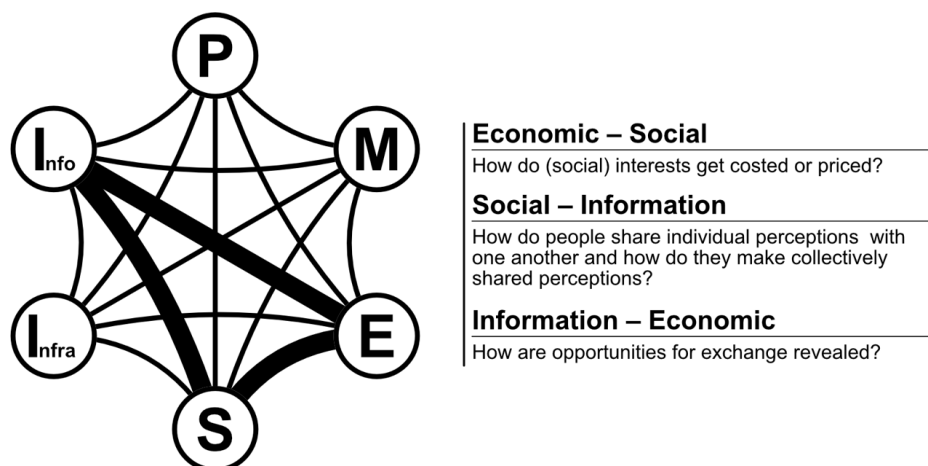
Figure 3. PMESII Order from Below (Source: Author)

Order From Within

"Order from Within" is an emerging source of city-as-system governance based on Information Communications Technologies (ICT), which include sensors, spatio-temporal analytics, and algorithmic decision-making.[30] Two ordering triplets and their associated paired variable questions are illustrated in Figure 4. Defining features of these sources of city-as-system order are "platforms," which are service-oriented, internet-based intermediaries that provide multi-sided markets for exchange. A multi-sided market brings different suppliers and different users together. Platforms not only connect suppliers and users, but also software applications to other applications.[31] The data and transaction metadata provide a basis to manage representations of conditions and events and to influence perceptions and future actions.

One "Order from Within" triplet, shown with thick black lines in the diagram, combines Political, Infrastructure, Information functional relationships. It can be understood as aligning with a "Government as Platform," notion in which technology companies work with agencies to leverage data and provide government services.[32] An example is Helsinki making its public transport schedules available. One platform-enabled outcome was a collaboration to help visually impaired individuals locate themselves and find transportation to destinations.[33]

The other "Order from Within" triplet, shown with thick grey lines in the diagram, combines Economic, Infrastructure, and Information functional relationships. It also leverages data to provide services but places the services in markets rather than within government agencies. Given examples of virtual communities like the WELL which started in 1985,[34] it could be argued that the Social variable should be used over the Economic variable for this triplet; however, the prevalence of corporate ownership of the platforms, the limited legal liability platform owners have in most parts of the Western world, and the selling of personal data (or associated metadata) suggests that at this time suggest the Economic variable is dominant. Private transportation platforms for taxis, electric scooters, and bicycles are examples.[35] A more expansive example that has been cut short of its original plans is Alphabet's Sidewalk City project in Toronto.[36]
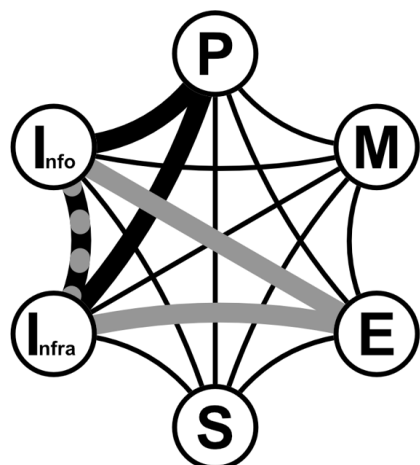
Political - Infrastructure
How do (social) interests get costed or priced?

Infrastructure - Information
How do people share individual perceptions (facts and opinions, aspirations, and fears)?

Information - Political
How are opportunities for exchange revealed?

Economic – Infrastructure
How do (social) interests get costed or priced?

Infrastructure – Information
How do people share individual perceptions (facts and opinions, aspirations, and fears)?

Information – Economic
How are opportunities for exchange revealed?

Figure 4. PMESII Order from Within (Source: Author)

CONCLUSION

The adapted version of the PMESII framework presented in this paper changes the "What…?" questions of a structural inventory to "How…?" questions about functional processes. This modification recognizes that seemingly similar structural features may be provided and used differently. For example, electricity infrastructure components for generation-, transmission-, and distribution might be owned and administered by a single public agency, by one or more private companies, or by a mix of public and private entities. Different configurations may constrain viable options for change. The adapted framework also poses "How…?" questions about functional relationships between each pair of the six primary variables. These questions highlight coordination between decision-makers. Finally, the adapted framework combines sets of three pair-wise questions to propose triplets of system order. The triplets serve to define the ways contingent relationships enable emergent system behaviour and patterns to support health, safety, and welfare. These higher levels of order effect the stability and predictability of the city-as-system. That is, the triplets provide a way to render the city's complexity more workable for more holistic change. The questions used to define each triplet provide a way to consider—or more formally to operationalize—well recognized notions about shaping the city from above through capital intensive command-and-control activities and shaping the city from below through market exchanges. The "Order from Within" triplet provides ways to consider how rapidly developing digital technologies can provide system order.

To return to the opening of this paper, images of the world provide cognitive anchors for observations, analyses, evaluations, and actions. Across eras, images of the city have ranged from hubs that bring out the best of human collaboration[37] to concentrations of poverty, pestilence, and prejudice.[38] The framework presented in this paper offers an image of the city as a functional system. Like any representation, it should not be confused for the object it describes, but it can be used to aid those involved with planning, designing, and managing cities evaluate performance and consider change. The advantage of a systems-based approach is it brings relationships of variables to the foreground so that second order and third- and fourth-order effects of a primary change will be considered explicitly. This kind of understanding is increasingly important because while a change to a system may be localized in space and over time, its effects may not be due to interactions with other parts of the system.

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STRUCTURING OF BIM CELL IN THE ARCHITECTURE UNDERGRADUATE COURSE: CASE STUDY

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INTRODUCTION

On 2020 the use of digital technologies experienced a boost after COVID 19 pandemics, due the social distancing policies, and home office. Some authors believe that this period is likely to be remembered as a critical turning point between the "*time before*", based on analog on-campus learning, and the "*time after*", when digital, online, career-focused learning will become the fulcrum of competition between institutions.[1]

During 2020 and 2021 home office and remote learning brought new possibilities, and in 2022 many offices decided to adopt the "hybrid" work, with professionals working partially from home. This alternative presented a new scenario, as workers did not need to commute daily. On the other hand, this new reality increases the need to learn how to work through collaborative platforms.

BIM (Building Information Modeling) is a methodology that allows collaborative design, with the potential to improve the quality of the project by incorporating the demands of sustainability, habitability, and environmental comfort, through digital technologies. Considering that the construction of livable buildings and cities depends on the quality of architecture design, it is imperative to prepare future professionals to explore the possibilities offered by BIM.

In this sense, this paper presents the results of a research project that aimed to implement a BIM Cell at the Faculty of Architecture and Urbanism of the Federal University of Rio de Janeiro - Brazil. BIM Cells are organized groups of professors and students from an educational institution, involved in proposing and developing a BIM implementation plan in one or more courses, with the aim of carrying out academic digital transformation actions.[2]

LIVABLE CITIES AND THE QUALITY OF DESIGN PROCESS

The quality of the built environment depends on the quality of the design management process. Unfortunately, design quality has often been compromised by mismatches and incompatibilities during the building design process. Clashes among hydraulics versus structure design, architecture versus cooling system are some examples of incompatibilities commonly faced by the design coordinator, and frequently identified only at the building site, during the construction phase.

Since the advent of digital technologies, discussions around strategies for the design management process have increased. Computer-aided design quickly spread through architecture schools, and the design process shifted from pen and pencil to PC and mouse. However, discrepancies among

solutions from different building design disciplines have migrated into the digital age as they were before, as computer-aided design could not avoid mismatches during the conceptual design phase.

Automation and digitization in buildings brought new aspects to be considered during the design process and increased the (already) extensive number of design disciplines and professionals participating to the conceptual phase of buildings. Modern building projects are extremely complex and there is no more time to waste in dismantling and even rebuilding models when they could have been assembled more efficiently from the beginning of the process if professionals had mastered the possibilities of BIM. However, if students are educated to work collaboratively and to learn the requirements of the other disciplines before they graduate, this level of misunderstanding is likely to be removed in the future.[3]

BIM can also be considered as a cooperation methodology, that can be used for management of documents and information, for budgets control, planning, schedule, environmental simulations and to analyze variables related to feasibility, costs, energy, and environmental performance of buildings. In this sense, considering the demand for a professional training in skills that allow the development of collaborative and integrated design, it is important to introduce the possibilities offered by BIM methodology from the beginning of the undergraduate courses.

But there are some resistances on BIM adoption in undergraduate courses, particularly because some academics did not perceive the impact on the design process, and understand BIM as a "software", or just a "set of software", restricting the students' professional development possibilities to strategies already known and outdated.

On the other hand, a group of professors is working to incorporate BIM into academia by reviewing the current curricula of undergraduate courses in architecture and engineering or proposing alternatives in teaching practices to improve professional training. These professors are part of what has been called "BIM Cells".

BIM EDUCATION: AN OVERVIEW

BIM education should be considered as a shared responsibility of academia and industry.[4] But practitioners often complain that university graduates are impractical or not hands-on, while educators at times argue that producing job-ready graduates is not an inherent responsibility of universities.

The World Economic Forum[5] highlight the importance of building a "skills-first" education system, empowering young learners to embrace and develop their uniquely human qualities – those unlikely to ever be replaced by technology. In fact, as pointed out in previous paper, BIM adoption involves not only the training on tools (use of software), but also a cultural change, which implies a review of the working process, enabling the development of integrated projects developed collaboratively. And as "collaboration" is a social skill, together with communication and negotiation, the technical approach solo will not be sufficient to properly disseminate BIM possibilities among architecture undergraduate students.

That is why it is so important to motivate professors to include BIM in their didactic practices, as they can lead their students to a more collaboratively academic environment and a more comprehensive approach on architecture learning process. In this sense, it is necessary to analyze the curriculum of architecture undergraduate course to identify opportunities to include BIM, presenting its possibilities in tandem with the teaching of the specific contents of the architect training.

A survey carried out in 2022 revealed that Brazilian researchers are searching alternatives for the adoption of BIM in architecture and engineering teaching.[6] 22 thesis and dissertations were identified from 2013 to 2022. Discussions about BIM implementation strategies characterize the researches. Curricular changes related to the insertion of BIM in teaching have also been discussed but only one dissertation discusses BIM skills development which is a fundamental aspect when considering the

collaborative design process proposed by the methodology. Among the factors that interfere with the implementation of BIM in teaching, the following stand out: the lack of available didactic support material; the lack of collaboration across disciplines; and resistance from the faculty administration. Collaborative work, despite being encouraged, was little explored, and the didactic experiences carried out were most often restricted to an isolated discipline, without the desired integration among contents, students, and professors.

These results confirm the hypothesis that there is no ready-made formula to implement BIM in undergraduate courses, and that each institution must establish its own strategy considering its characteristics. In this sense, higher education institutions, especially those which are still in the entry level of BIM adoption, may begin to develop a vision, strategy, and roadmap for the integration of BIM in the academic environment as soon as possible, as the gap is widening between education and the demand of AECOM industry.[7]

Regardless of the size of the institution, a collaborative environment is critically important, and can also accelerate the BIM adoption process. However, the challenge of placing as much complexity on just one field of study, such as BIM, must be analyzed, as it is difficult to change an entire course structure to include it. In addition, faculty members need to learn BIM before incorporating it into their disciplines and teaching it to students.[8]

Social aspects of BIM implementation must also be considered. The difference between a successful BIM implementation and a failed one has as much to do with the mindsets and attitudes of those who use it, as it does to the technologies.[9] It is necessary to align people's attitudes, mindsets, and work habits to excel in BIM environment.

Aiming to disseminate BIM and modernize the civil construction industry, the Brazilian Federal Government stablished in 2019 a BIM Brazil Strategy through the Federal Decree No. 9983/2019.[10] The main purpose is *to promote the modernization and digital transformation of construction, boosting the use of BIM.* In this same year, the Ministry of Economy published the Bid Notice[11] to celebrate a *Term of collaboration for the execution of actions to promote gains in productivity and competitiveness in the civil construction sector.* Among the nine goals of this notice, five are related to BIM dissemination:

• Goal 3) Disseminate BIM and its benefits.

• Goal 4) Support public sector structuring actions for the adoption of BIM.

• Goal 5) Create favorable conditions for public and private investment in BIM.

• Goal 6) Develop technical standards, guides and specific protocols for BIM adoption.

• Goal 7) Stimulate the development and application of new technologies related to BIM.

• 7.1 Carrying out controlled experiments in real spaces to test the insertion of Industry 4.0 concepts in BIM models.

• 7.2 Creation of a "BIM Cell" in a public University.

BIM Cells[12] are organized groups of professors and students from an educational institution, involved in proposing and developing a BIM Implementation Plan, in one or more courses, with the aim of carrying out academic digital transformation actions.

The complexity of built environment has increased exponentially last years, and it is impossible for one single professional to be a master of all the disciplines. That is why it is necessary to prepare professionals since the undergraduate course to understand which information is required in the different stages of a project, so the team could set building models efficiently, working collaboratively since the beginning. And BIM offers a great opportunity to engage students more effectively and to aid understanding of how buildings are constructed.[13]

RESEARCH METHODOLOGY

To implement a BIM Cell at the Faculty of Architecture and Urbanism of the Federal University of Rio de Janeiro, an Implementation Plan is organized in four phases: Planning of Actions, BIM Cell Installation, Detail of Activities and Follow up. The research initiated with the identification of professors' interests in BIM, identifying disciplines that could benefit from BIM adoption. At first, a survey was carried out with professors from all Departments of the Faculty. 36% of professors have already been contacted and they all answered YES when asked about their interest in BIM.

The second activity of the research project was to analyze the architecture undergraduate course curriculum to identify which disciplines could benefit from BIM adoption. For this analysis BIM Domain Model Uses were adopted to stablish a pathway for including BIM in architecture teaching process.[14]

BIM Model Uses can be defined as a method of applying modelling during a facility's life cycle to achieve a specific objective. Each implementation of Model Use will include the following items: a process, information, infrastructure, level of maturity, potential impacts, and references to support that specific approach. These characteristics are often shared between multiple Model Use Purposes.[15]

There are seven categories for BIM Domain Model Uses,[16] with specific uses: Capturing and Representing, Planning and Designing, Simulating and Quantifying, Constructing and Fabricating, Operating and Maintaining, Monitoring and Controlling and Linking and Extending. Aiming to identify opportunities to include BIM in the architecture teaching process, the architecture undergraduate course curriculum of the Federal University of Rio de Janeiro[17] was analyzed through the lens of six categories of BIM domain model uses (except *Linking and Extending*, as it was not applicable). Figure 1 presents the result of this analyses.
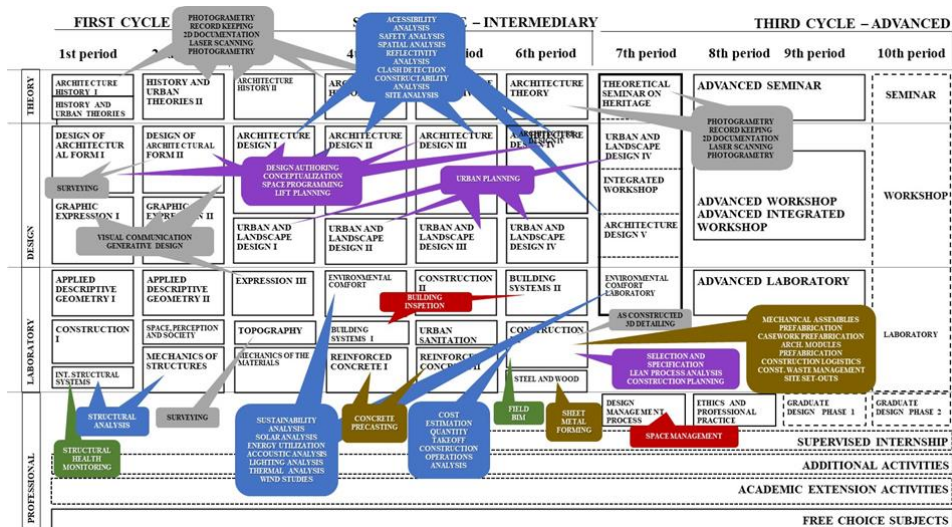
Figure 1. Analysis of architecture undergraduate course contents through BIM Model Uses.[18]

The analysis carried out based on the syllabi, allowed several inferences given the possibilities of integration among disciplines – evidenced by BIM Domain Model Uses analyzes. In summary, the results of the analysis were.[19]

- the uses of the BIM Model related to Capturing & Representing, Simulating & Quantifying and Monitoring & Controlling can be explored since the beginning of the course, gaining in complexity as the student acquires knowledge about the contents;

- the uses of the BIM Model related to Capturing & Representing offer alternatives for teaching theoretical subjects (history of architecture, heritage documentation, among others) allowing the student to understand the potential of BIM beyond the modelling of geometric information;

- the uses of the BIM Model related to Planning & Designing, and Constructing & Fabricating have the potential to be strongly explored in the intermediate periods of the course (from the third to the seventh period) in line with the disciplines of architectural design and construction technologies;

- opportunities to explore the use of the BIM Model related to Operating & Maintaining and Monitoring & Controlling have few direct connections to a specific discipline. However, professors can introduce these uses through planning, design, construction, and technology disciplines.
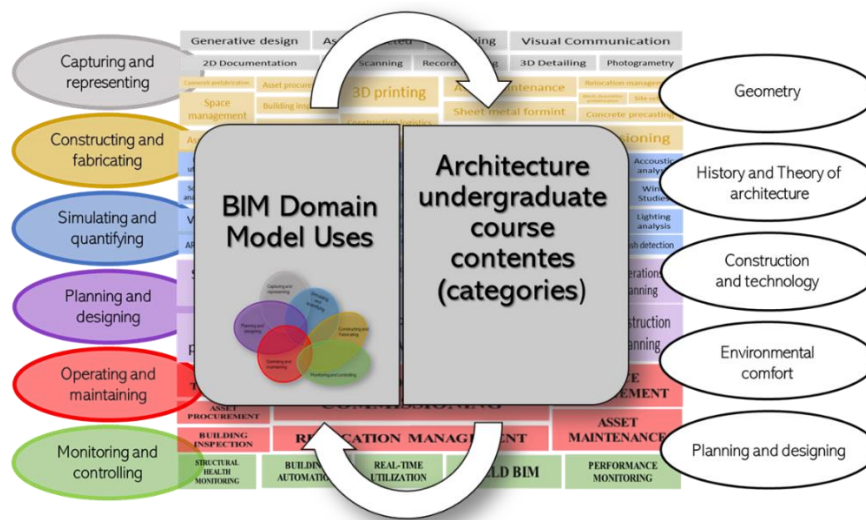
Figure 2. Relating BIM Domain Model Uses to Architecture Undergraduate Course

After this first analysis and considering its results, a group of professors were invited to join a workshop with a specialist, to discuss alternatives to include BIM in their didactic practices. This activity occurred at the end of 2022, and since them each participant has developed proposals on how to include BIM in their undergraduate classes, in subjects such as: geometry, constructive process, environmental comfort and building systems.

PRELIMINARY RESULTS

After identifying the interest of professors and the possibilities to adopt BIM in architecture teaching, the next phase of the project is the Installation and operation of the BIM Cell. This phase can also be referred as "*BIM Cell in action*" and involve the following activities:

- *BIM Cell Workshop during the Annual Architecture Graduate Program Colloquium* – the main purpose was to present what is a BIM Cell, and to help professors from different Universities, and also architects interested on the subject, presenting alternatives to face the challenges and develop a BIM Implementation Plan;

- *Creation of a new discipline entitled 'BIM in architecture education'* – the first class occurred on 2022, bringing together master's and PhD's students of the architecture graduate program at the Federal University of Rio de Janeiro (Brazil), and professors interested in BIM adoption. The discipline called the attention of the Faculty's staff and some professors participated as "listeners" to understand the challenges related to BIM adoption and discuss alternatives with the masters' and PhD's students.

Among the activities developed in class, the BIM Maturity Model for Higher Education Institutions[20] has been explored. The Matrix can be applied by the members of the institution as an internal knowledge tool to measure performance, as well as it can be used for measurements by external agents.

- a Book entitled *BIM in architecture education* – This book brings together proposals from professors interested in adopting BIM as a didactic strategy teaching different contents of the architecture and urbanism undergraduate course. Master's and PhD students also participated as co-authors in some chapters, sharing their proposals for BIM adoption in teaching subjects such as: geometry, environmental comfort, water and sewage systems in buildings, architectural design, lighting comfort, work budget and construction processes.

While initial results are encouraging, there is still much work to be done. Some professors still show great resistance to digital technologies and see BIM as a tool and not as a methodology. The challenge is just beginning.

PROPOSALS TO INCLUDE BIM IN EDUCATIONAL SETTINGS

Professors and PhD students are discussing alternatives to include BIM in architecture and engineering teaching. Annually these group of practitioners gather during the "National Meeting of the BIM teaching" conference. The analyses of content presented in these conferences allow to identify three main trends: BIM in teaching, teaching of BIM and integration of different disciplines through BIM.[21]

Among the alternatives for including BIM in teaching, the experience of professors at the Federal Rural University of Rio de Janeiro stands out. The teachers proposed the development of BIM models of construction elements integrating Construction Technology classes together with the libraries, templates, nomenclatures, and file structures established with the students in the IT classes applied to architecture. The contents explored were also adopted in the fifth period's Architectural Design classes.[22] In addition to the integration of theoretical content, the experience worked on the principles of collaborative design.

In other experience professors divided the class in two groups of architecture students. The first were introduced to a specific project to the building's BIM model, while the second analyzed the same building considering only images found on the internet. Results revealed that the group with access to the building's BIM model had a better understanding of the architecture and construction details, when compared to the second group. The authors concluded that BIM tools and models, when applied in the reflective teaching-learning process, can stimulate, and facilitate project learning, with the potential to make codifiable knowledge explicit and facilitate the explanation of tacit knowledge presented in architectural works.[23]

Another interesting experience in adopting BIM has been conducted in 2022, during the classes of "Educational Architecture Project" of the Architecture and Urbanism undergraduate course at the Federal University of Roraima (UFRR). Students developed their projects using any BIM software that met their design needs, but, at the end of the semester, the model was shared with professors in the IFC (Industry Foundation Classes) format, enabling analysis through the free BIM Model viewer. As IFC is an open file format, professors were able to evaluate the models, even been generated by different software.[24] These examples are some alternatives to considered depending on the specific content to be taught.

CONCLUSION

Since COVID 19, some changes have been made to the teaching and learning process, because of the social distancing imposed by the pandemic. In this context, interest in Building Information Modeling found fertile ground among architects and engineers. The time has come to continue the changes started in 2020, exploring the possibilities offered by BIM in architecture teaching. BIM Cells have an important role in this process, bringing together professors and student exploring the potentialities offered by the methodology

The next step will be the adoption of City Information Modeling (CIM), which has been pointed out by some authors as an extension of the BIM concept to the urban space.[25] CIM aims to facilitate the integration among design decisions and urban planning, enabling the modeling of cities. Digital mapping information can help the government to improve urban planning, analyzing the electrical network, improving water and sewage networks, improving ventilation and accessibility, combating landslides, and improving garbage collection.

The integrated vision of BIM and CIM can improve the design of cities and should be part of architecture and engineering professional training, and BIM Cells can be the first step towards disseminating the possibilities of digital methodologies for collaborative design aiming at integrated projects for livable cities.

ACKNOWLEDGMENT

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FROM OLD TO NEW:
THE CHARACTERISTICS AND VALUES OF SHOP ATMOSPHERES IN REPURPOSED BUILDINGS

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INTRODUCTION

Buildings and their construction consume approximately 40% of the world's energy. Buildings are also the largest global consumers of raw materials and yield around 40% of global carbon emissions.[1] In a time when climate change and its consequences are clearly noticeable globally, adaptively reusing existing architecture is often less harmful than tearing down buildings and constructing new ones. By prolonging the useful lifetimes of existing buildings, we save on the materials and resources required to replace them while considerably reducing waste.[2]

Retail and hospitality projects are heavily resource intensive. They often have short lifespans, ranging from a few days for exhibitions and pop-up shops to a few years for stores or restaurants.[3] Although some stores and restaurants last for decades, they are exceptions that prove the rule. In a competitive industry with a strong focus on aesthetics, stores and restaurants are rapidly updated to stay relevant and attractive to consumers.[4] Consequently, there is tension between the objectives of commercial servicescapes and sustainability.[5]

However, many brands and consumers increasingly prioritize sustainability issues when choosing products, creating a trend toward purpose-driven brands.[6] The focus is still the sustainability of the product consumed rather than the store design, but the heightened environmental awareness is also affecting the designs of places where products are bought or consumed, as has recently been observed in websites and job posts made by retail design studios.

A trend in European cities in which cafés have resurrected abandoned buildings in remote areas and become destinations for locals and tourists offers one way to enhance sustainability. Placing shops in repurposed buildings has both environmental and aesthetic benefits. Following the current trend of industrial-style design, empty industrial buildings can serve different purposes: "No longer is seediness ugly, it is now a sign of authenticity."[7] This movement is global. For example, in Copenhagen, the old meatpacking district has been transformed from a slaughterhouse area to a cultural hotspot with restaurants, galleries, nightclubs, and cafés.[8] Several hotels occupy repurposed buildings: Villa Copenhagen overtook the former post and telegraph office, while Hotel NH Collection is located in the former headquarters of shipbuilder B&W.

These buildings have been remodeled such that the old and new are intertwined and cannot exist independently from each other, but projects with fewer interventions also exist. For example, coffee

shops have been installed in remote buildings, offering unique experiences for those willing to spend time and energy on bike rides. Whereas studies of repurposed buildings have focused on expert evaluations, little research has examined how users perceive these environments. In addition, most scholars focus on repurposed heritage or historical buildings.[9] Only a few studies have examined commercial buildings.[10]

To illuminate the role that repurposed buildings play in customers' experiences, this study explored perceptions of coffee shops in repurposed buildings in Copenhagen. The study was guided by two questions: "What are the characteristics of repurposed buildings used for coffee shops in Copenhagen?" and "How do these places facilitate and create value for contemporary users?"

BACKGROUND

Adaptive reuse of buildings for stores

The circular economy (CE) is an approach that is "restorative and regenerative by design and aims to keep products, components, and materials in circulation and at their highest utility and value at all times."[11] Prolonging buildings' useful lifetimes by adapting them to new requirements of different uses can save materials and resources, and the reuse of old buildings for shops is thus an example of CE.

Kent[12] explained that architecture can help retailers create unique experiences. In this context, he discussed new buildings and the reuse of old buildings. For reuse, he highlighted the importance of an in-depth, rich dialogue between the old and the new that integrates and portrays the site's history. Kent called for further research on the connection between the new and the past, including research into store environments and atmospherics.

Atmospherics in store design

Our physical surroundings affect us in many ways while influencing our perceptions of objects and experiences within them.[13] In 1973, Kotler[14] explored the subtler aspects of service environment design, emphasizing "atmospherics," or, as he described it, "the conscious designing of space to create certain effects in buyers." Kotler believed that a store's atmosphere can be more important than its products, especially in industries where price differences are minimal. Scholars inspired by Kotler have undertaken diverse studies of spaces where products are bought or consumed,[15] showing that locations and buildings themselves are crucial to the in-store experience. Turley and Milliman[16] identified and categorized 57 atmospheric variables germane to retail design, including the location, surrounding area, and architectural style (Table 1). Since their categories include variables relating to location and built structure, we can conclude that the use of a repurposed building can strongly influence a shop's atmosphere.

However, as with any interior, design variables in a store environment are never experienced in isolation. Each variable is part of a complex fabric of numerous variables that can be combined in many different ways and are thus experienced holistically.[17] For these reasons, scholars have increasingly called for more holistic studies.

Exterior variables	General interior variables	Layout and design variables	Point-of-purchase/ Decoration variables	Human variables
Exterior signs	Flooring and carpeting	Space design and allocation	Point-of-purchase displays	Employee characteristics
Entrances	Color schemes	Placement of merchandise	Signs and cards	Employee uniforms
Exterior display windows	Lightning	Grouping of merchandise	Wall decorations	Crowding
Height of building	Music	Work station placement	Degrees/certificates	Customer characteristics
Size of building	P. A. usage	Placement of equipment	Pictures	Privacy
Color of building	Scents	Placement of cash registers	Artwork	
Surrounding stores	Tobacco smoke	Waiting areas	Product displays	
Lawns and gardens	Width of aisles	Waiting rooms	Usage instructions	
Address and location	Wall composition	Department locations	Price displays	
Architectural style	Paint and wall paper	Traffic flow	Teletext	
Surrounding area	Ceiling composition	Racks and cases		
Parking availability	Merchandise	Waiting ques		
Congestion and traffic	Temperature	Furniture		
Exterior walls	Cleanliness	Dead areas		

Table 1. Categories of atmospheric variables (Turley and Milliman 2000)

Methods and analysis

This study employed a qualitative, mixed-methods approach, using several datasets, including observational studies, interviews, photos, and videos. Place and environmental observations[18] and participant observations[19] were conducted first, followed by on-site interviews with store representatives and consumers. The goal was to understand the reasoning behind store locations and redesigns and assess their impact on users. The sample is not representative of all coffee shops in repurposed buildings but provides insight into the motivations for developing and visiting these places. The studies were conducted between January and April 2022.

Case selection

The cases were selected by studying social media posts, websites, and articles, as well as through conversations with local residents. The city's tourist agency, Wonderful Copenhagen, was also contacted. The locations were visited and the surrounding neighborhoods explored to look for other potential cases. Using this snowball method, 17 coffee shops in repurposed buildings were identified, which constitute our first dataset. (Illustration 1).

Figure 1. Identified cafés in repurposed buildings in Copenhagen, Spring 2022. The seven shops marked with large dots are where semi-structured interviews were conducted.

Observational studies

Place observation studies provided an opportunity to thoroughly observe and describe the atmospheric variables. Participant observations illuminated how the places were utilized by users and how the users behaved, and they provided access to casual interviews with staff and customers. To counteract the risks of reanimating old habits and developing selective, predetermined ways of seeing the environments,[20] all shops were visited by at least two researchers several times at different times of the day and days of the week. Field notes were taken during the observation studies, and photos and videos were captured both inside and outside the coffee shops.

Semi-structured interviews

To acquire different perspectives on the buildings' impacts, it was decided to conduct interviews with customers and store representatives (owners, partners, or managers) who had been involved in the implementation process and thus knew the intentions behind the stores' designs and locations.

Store representatives who had been involved in opening a coffee shop were contacted, and meetings were scheduled in advance via email. Interviews were conducted in cafés where we managed to gain access to store owners (Table 2). However, two store representatives were not available for interviews, and therefore, only customer interviews were conducted for those cases. The interviews were conducted on site, recorded, and transcribed. The representatives were asked to share the

reasons for choosing the sites and their experiences during the remodeling process. These interviews lasted 10-38 minutes.

Case	Café Name, abbreviation	Store Representatives	Customers
#1	AB	Manager	2
#2	BA	Partner	2
#3	CC	Building Project Manager	2
#4	FF	-	2
#5	LB	Founder and Owner	2
#6	LI	-	3
#7	PC	CEO and Co-Owner	2

Table 2. Cases in which semi-structured interviews were conducted.

For customer interviews, the customers were randomly approached in the store and invited to participate in a study on in-store experiences. Those who agreed to participate were first asked to share information about their café habits and reasons for visiting the specific café. They were then asked about the atmospheric variables in the café, their awareness of the building's history, and how it affected their experience. This approach allowed respondents to express their thoughts and experiences in their own words. These interviews lasted between 4 and 15 minutes.

Interior and exterior images from each of the seven stores are provided in Photos 1–7 (authors' own photos).

Figure 2. Photo set 1. AB

Figure 3. Photo set 2. BA

Figure 4. Photo set 3. CC

Figure 5. Photo set 4. FF

Figure 6. Photo set 5. LB

Figure 7. Photo set 6. LI

Figure 8. Photo set 7. PC

Data analysis

Content analysis was conducted to identify themes and patterns in the data. This process began by establishing familiarity with the data by transcribing the interviews and coding the texts, images, and field notes. Initially, we searched for common themes related to locations and building characteristics. In the final round, we aimed to establish a link between the site's characteristics and the values expressed.

RESULTS

In this section, characteristics that were determined to affect users are categorized and presented. These characteristics are supplemented with quotes that express how respondents felt about these elements and whether they created value for the visitors. The characteristics are divided into the following themes: original building constructions, appealing surroundings, remote locations, spacious buildings, daylight, and historic features.

Original building constructions

Store owners described how they intentionally preserved the buildings in their original conditions because they saw this as valuable to the in-store experience they wanted to create. For example, a store representative referred to a wall that was kept untreated to show marks from the benches that used to be in the room when the building was used as a waiting area for the ferry. Preserving the original wall was intended to be both a decorative and narrative feature.

The industrial style of the buildings was considered attractive and consistent with current trends. One store owner said, "I do like these old industrial windows, and it gives it an extra vibe, which you can't necessarily get if you build it from scratch."

In analyzing the values derived from the original building structures, we found that several interviewees used the word "authentic": "It's so different from the standard cafés in Copenhagen. I would say it's authentic. They have their own styles. Like, nowhere else can you find a place like this."

Others argued for the presence of authenticity by highlighting historic elements integrated into the café's interior, asserting that this made the place more "real." This suggests that the original structures and elements can add value to the present experience and that original features can create interesting customer experiences.

Appealing surroundings

Some customers suggested that it was not only the coffee shop but the characteristics of the entire neighborhood that influenced their experience: "I like the surroundings. It's near the water. If you want, you can sit outside and go swimming, or just enjoy the sun. Inside, it is very nice that you have a view of the sea." Another mentioned that the building was in an area without much traffic: "When you sit outside, it's really relaxed, not a lot of cars."

All of the shops had outdoor seating areas arranged so that the customers looked out on the neighborhood. Planters, parasols, and other objects were used to frame the outdoor areas and create an intimate, protected outdoor space near the shop. Observations at different times of the year showed that outdoor furniture was often present year-round, even when the weather made outdoor seating unattractive. This suggests that outdoor furniture is employed not only for seating but also for its signal value. As one store representative commented, "We also use the outdoor furniture to show customers that the store is open."

Located as they are in relatively remote areas that may be new to visitors, the design of these outdoor seating areas can be seen as creating a safe haven from which customers can observe and gain confidence in the surrounding neighborhood before exploring it further. As a recent study suggested, visitors consume not only coffee but the neighborhoods of cafés themselves.[21]

Remote locations

None of the shops studied were in the city's central commercial district. The remote locations make the areas quieter, which users seemed to appreciate: "It is not too crowded here, which is very nice," one customer said. Others mentioned that the quiet made the shops suitable for working. Reduced

traffic was another appreciated factor: "The vibe is just very easy going. It is very inviting, calming, and easy," a guest said, adding that it was relaxing because of the lack of traffic noise and activity. Contrarily, remote locations make these cafés harder to reach, which requires additional transportation time but also adds an element of exclusivity. One respondent said, "Like, tourists, they would often go to [corporate brand in the city center], where for me, [corporate brand in the city center] is nothing special," differentiating between guests who know these cafes and those who do not: "Here, we feel that we are more a part of Copenhagen than other people are."

Spacious buildings

Being located outside the busier commercial districts often makes more space available. This applies both to the outdoor seating areas and interiors. Interviewees described this spaciousness in various ways: "Yeah, it has a modern, open vibe to it," or, "I feel like it's very, like, airy. I like that. In a sense, there is a lot of space. The ceilings are high. Like, you can breathe." Some referred to specific architectural elements, such as ceilings or windows: "The ceiling, it's pretty high compared to other places," and, "There is a big window area where you can sit and look out over the water."

Daylight

Another benefit of a remote location is access to daylight since the buildings are often short and spaced out. This allows sunlight to filter down between the buildings: "There are not that many places in Copenhagen where you have that much space," a store owner mentioned, explaining that his shop gets sunlight from 8 a.m. to late in the evening: "This is unusual in Copenhagen. Usually, other buildings will block the view or cover the sunlight." He went on to explain that many of his regular visitors enjoy sitting outside in the sunshine.

Historic features

Some shop owners chose to preserve and expose elements of the original buildings, often ones that told stories about their previous uses. Both store representatives and customers mentioned that they liked that the buildings have histories. However, the actual histories of the buildings did not have a major influence on customers' decisions to visit them. For customers, the current atmosphere in the shop was more important: "It's not because it has a history […] it's the way that they [the new shop owner] have embraced it […] So it feels a little bit more, I don't want to say authentic, but it kind of feels a bit more real, I guess."

The presence of historic elements was mentioned by most respondents, and many customers expressed appreciation for the history of the places being kept alive: "I think it's nice to have a building that has already kind of a history behind it." When asked directly whether they preferred cafés in repurposed buildings or modern buildings, many customers referred to a special "vibe" that they liked in repurposed buildings: "I think it's the vibe that I get, and the environment as well. So, I think I can speak for a lot of Copenhagen citizens when I say that. We don't like commercial new places as much as we like historical places."

The stories did not have to be grand tales; even small testimonies about the previous uses were appreciated by new users. The analyses also showed that the atmospheric variables, which were chosen to be preserved, not only originated from the buildings' original states but could also stem from later occupations. The buildings and their histories were considered as a whole, and the stories that the buildings themselves and the new users told could come from different stages of the buildings' lives.

CONCLUSION

This study demonstrates how repurposing buildings not only provides environmental benefits but adds significant value for new users. Original building constructions were found to be attractive and in line with current trends. Users perceived them as authentic and unique. Locations in appealing neighborhoods and outdoor seating were seen as attractions for customers, who visited the places not only for the café but to enjoy its surroundings. Remote locations were appreciated because they are quieter, less crowded, and not accessible to everyone. Remote locations offer more space and access to daylight, which city dwellers, who often live in small apartments, find attractive. For all these reasons, shops located in repurposed buildings in remote locations seem to offer an appreciated escape from the city.

Our findings indicate that places themselves become objects of consumption, particularly visually. The additional findings—namely, the presence of storytelling, the relevance of both the building's original form and previous lives in the renovation process, and the identification of challenges in implementing shops in repurposed buildings—lay the groundwork for future research.

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HOW CAN REAL HISTORY BE BROUGHT TO REAL LIFE? PRATHERS ALLEY ACTIVATION

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INTRODUCTION

The Washington Alley Project (WAP) proposes strategies and methods for ensuring that as Washington, D.C. continues to develop, the unique alley network of urban spaces do not go underutilized. Begun as an academic research endeavour, WAP has evolved into a manifesto for spatial advocacy.

This paper provides a deep dive into the re-envisioning of a 21st century alley via the recently completed Prathers Alley Activation project. It highlights a process driven by community engagement as a model for urban design practice nationwide.

The project to reimagine Prathers Alley, located in the Mount Vernon Triangle neighborhood, reclaims historically underutilized alley infrastructure to inspire culture, commerce, and connectivity. A partnership with the Mount Vernon Triangle Community Improvement District afforded an opportunity for WAP advocacy work to become realized in built improvements: a public art walk, mobile market, and traffic calming. A vinyl mural pays homage to the former Northern Liberty Market, a cultural anchor of its time, and hosts a rotating photography installation highlighting community stories. A family of mobile market stalls brings activity and commerce to the alley. The final intervention converts the alley to one-way traffic and delineates a pedestrian path, allowing people and vehicles to safely occupy the alley together.

The project is multidisciplinary and multipronged. After a series of community surveys and design workshops, the team worked to pair portions of the project scope with potential grant opportunities. Design development, fabrication, and installation was implemented as funding was secured for each component.

THE WASHINGTON ALLEY PROJECT

Work under the WAP umbrella falls into three categories:
- Research: mapping the physical evolution of the alleys and establishing an agenda for future development;
- Outreach: public engagement, creation of awareness, and the identification of program;
- Advocacy: connecting with stakeholders and the development of design proposals for new built interventions.

Research

The project began with extensive research into the history of DC's alley network. The L'Enfant plan's modulated grid, scaled to accommodate the monumental, necessitated subdivision in order to accommodate the commercial and residential needs of the city. Alleys emerged in response to the urban pressures of the 19th Century but were systematically neglected in the 20th Century and have not since been adapted to optimize their potential usage.

Outreach

The project's primary avenue for community outreach is the Alley Hop, a playful self-guided tour of DC alleys. Alley Hop participants, or 'Hoppers,' are armed with 'low-res virtual reality goggles' that highlight specific panoptic moments in the alleys overlaid with drawings and collages that help bridge between the alley spaces of past, present, and future. Alley Hops have ranged in focus from uncovering history in Shaw, preservation of the urbanscape in Capitol Hill, to crowdsourcing alley optimization ideas as a part of the Apple Carnegie Storyteller Festival. Alley Hoppin', an exhibition designed to share WAP research and design work with DC residents, opened to the public in Spring 2020 at the District Architecture Center in downtown DC.

Advocacy

Since its conception, a robust public participatory process including public surveys and design workshops has been central to WAP. The project team has continuously engaged community members, stakeholders, local and neighboring community organizations and municipal entities including the DC Department of Transportation, DC Office of Planning and DC Arts & Humanities.

THE ALLEY CONTEXT

Figure 1. The District's baroque plan, sized to accommodate monuments and buildings of state, yielded an informal network of alleys that can accommodate housing, commerce, and culture. The magenta bands indicate over-sized blocks; the background is the Ellicot Plan for the city.

The Alley Emerges (Theoretical Context)

Although Washington, DC was intended to be a physical embodiment of the democratic process, the city as designed historically elicited the isolation of social, racial, and economic groups. L'Enfant's plan for the federal city emphasizes symbolic structures with broad view corridors connecting them, creating an atmosphere of surveillance and observation. The scale of these connecting avenues creates distinct edges to neighbourhoods which inhibit easy mixing. But as Richard Sennett noted in the Pnyx and The Agora, true democratic space brings diverse people together and acts as a forum for the exchange of thought and opinion.[1] In contrast, alleys are an invisible, "local" service infrastructure that fosters that sort of mixing that true democratic space should embody. They provide an informal space of exchange nested within but outside the surveillance corridors of the Federal City.

The Alley Disappears (Historical Context)

Alleys emerged in response to the urban pressures of the 19th Century but were systematically neglected in the 20th Century and have not since been adapted to optimize their potential uses.

1810-1850

Alleys are constructed as a practical response to the infrastructural oversights of the L'Enfant plan. They provide conduits for the removal of trash and open sewage; they contain grazing, pens and stabling for livestock; they are the location for fast, cheap and rudimentary dwellings constructed to house enslaved people and laborers working on federal construction sites.[2]

1850-1950

As landlords move further from the city center and the population of the city rapidly increases in the wake of the Civil War, physical conditions within the alleys deteriorate, even as a sense of identifiable community expands. Alley dwellers of various races lived side-by-side unlike in the segregated street-facing dwellings. Small shops and informal banks served the needs of shift workers who would have difficulty accessing more formal versions.[3] However social change and the focused reporting of Reform Movement journalists like Jacob Riis prompts the Federal government to increase regulation, gradually limiting new construction in alleys and with the1935 Alley Dwelling Act, outlawing dwellings in alleys altogether.

1950-2000

The eradication of DC alley-dwellers and alley-workers contributes to a larger trend of increasing isolation between disparate demographic groups. The federal Alley Dwelling Authority built new affordable housing complexes in further districts along the city's periphery. The once active hubs within the block structure, were depopulated and devoid of businesses other than garage and service repair shops. Some alleys with contiguous groups of better-quality masonry rowhouses were adopted into the formal city plan and made into official streets; a few have transformed into commercial and cultural attractors; most remain utilitarian and unseen.

2000-present

DC's mandated height limit and tight boundaries limit the supply of developable space while population continues to surge; growing demand increase demographic disparities even further and the city faces a sever housing shortage of every type, but particularly affordable options.[4]

3,217 EXISTING ALLEYS
SPREAD ACROSS 4 QUADRANTS
= 246 MILES OF ALLEY FRONTAGE

🏠 = 1,000 PROPERTIES
THERE ARE 82,397 SINGLE FAMILY
RESIDENTIAL PROPERTIES WITH
ALLEY FRONTAGE.

👤 = 10,000 PEOPLE
IF EACH OF THESE PROPERTIES ADDED
AN ACCESSORY DWELLING ON THE
ALLEY, IT COULD PROVIDE HOUSING TO
AS MANY AS 187,900 NEW DC RESIDENTS!
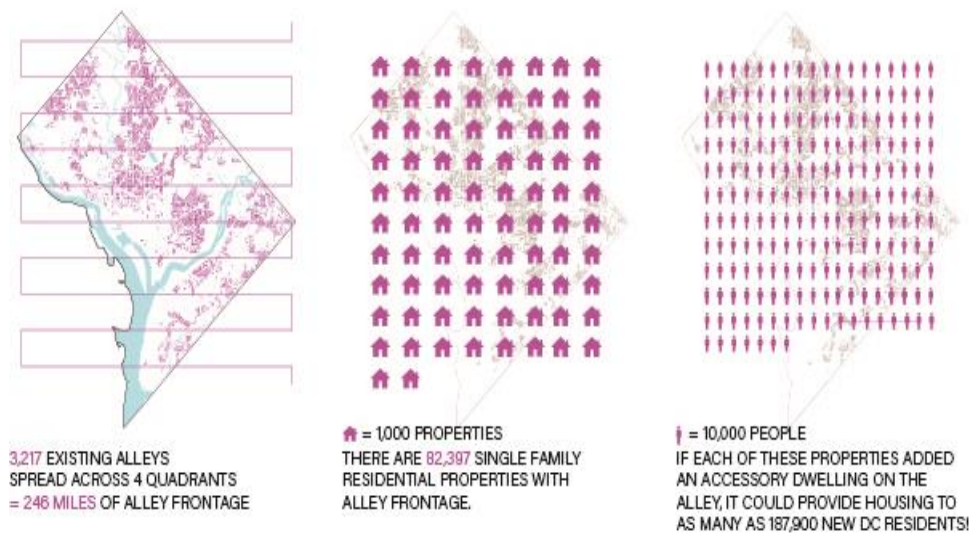
Figure 2. The activation of DC's underutilized alley network has immense implications for serving the city's residents.

The extant alleys represent the persistence of informal space, with an unrealized potential to provide for growth in the city's density and diversity. Revealing and reactivating alleys could provide much needed (affordable) housing and space for inclusive community building. But the quality of the public space must improve to shift public perception of the viability of these 'informal streets.'

Prathers Alley Context

The Mount Vernon Triangle neighborhood consists of 17 blocks in Northwest DC; a triangle formed by New York, Massachusetts, and New Jersey Avenues directly east of Mount Vernon Square, each a broad avenue carrying considerable traffic. The district sits at a nexus between governmental buildings to its south, residential areas to its north, and infrastructure to the east.

Once part of the larger "Northern Liberties" (area outside the practical city limits), the district was largely undeveloped prior to the construction of the 7th Street Turnpike in 1810.[5] 7th Street became a vehicular artery connecting public marketplaces adjacent to the National Mall to populations living to the north of the city. Development intensified when, in 1845, the locus of market buildings shifted north to Mount Vernon Square to make room for institutional buildings along the Mall. The district became quickly populated with working class, immigrant, and African American residents, working as merchants, craftsmen and laborers in the nearby market and supporting businesses. As the Northern Liberty Market complex continued to grow, a second floor was added to the main market building to serve the city as Convention Hall.
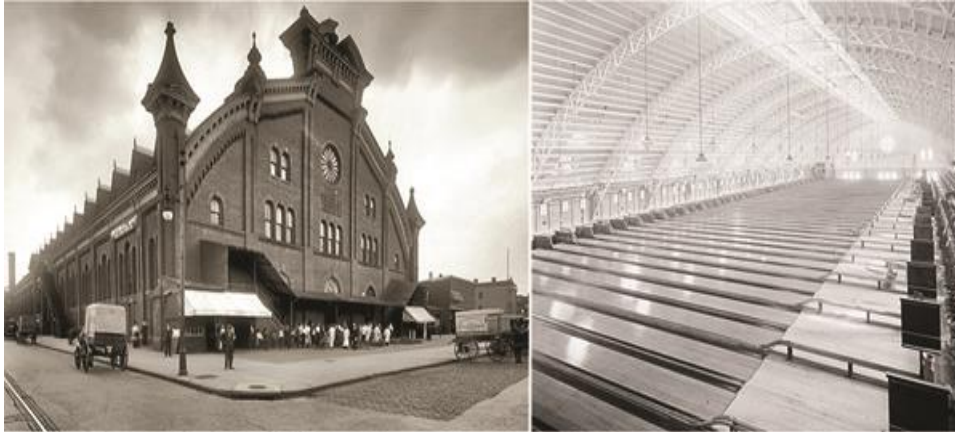
Figure 3. Northern Liberty Market, which became Convention Hall. The auditorium was converted into a bowling alley in the 1920s. The roof truss motif appears in the vinyl mural installation.

By the end of the Civil War, the district was dense enough to support alley-specific development. In particular, Prathers Alley developed as a mixed-use hotspot: two-story brick alley dwellings, stables, and commercial enterprises filled the inner block. A bakery, which eventually because one of the city's preeminent, was built in the alley in the 1880s; a dairy bottling plant was added in the alley in 1904; and a blacksmith shop in 1912. These warehouse spaces were consolidated in the late 1910s and converted to an automotive repair garage, indicative of the city's ongoing transformation to accommodate vehicular traffic.

The proliferation of automobile-related businesses, coupled with the rise of residential suburbs, drove the widespread commercialization of the district. The middle-class families that owned and worked in the area largely moved out. Many homes were converted into boarding houses. A 1946 fire destroyed Northern Liberty market, precipitating a wave of commercial closures and demolitions. Much of the area had been converted to vacant lots even before the uprisings following the assassination of Martin Luther King, Jr. and the construction of Interstate 395 alongside New Jersey Avenue caused further destruction.

Beginning in the early 2000s, the Mount Vernon Triangle area has seen intense redevelopment spurred by a public-private partnership between the DC Office of Planning, property owners, and developers.[6] The block surrounding Prathers Alley is indicative: the 2010 renovation of a '70s office building on the southeast corner of the block, currently under long-term lease by the Board of Veterans Affairs, added over 23,000sf of street-level retail space.[7] Four mixed use buildings built on the block between 2015 and 2018 added just under 1,000 rental units and over 30,000sf of retail space.[8] The apartments are largely one-bedroom units, catering to a young, professional, and transient demographic. The new developments utilize the alley to access underground parking garages and as service access to the ground-floor retail.

Located at the center of such sudden density, Prathers Alley became a popular pedestrian and bicycle cut through. The comingling of pedestrians, bikes, cars, and service vehicles prompted the area Community Improvement District to seek partners to activate the alley.

PROCESS: COMMUNITY PARTNERSHIP AND COMMUNITY DESIGN

Figure 4. Prathers Alley Activation funding sources and programming partners.

ACTIVITIES:

EXPERIENCING ART (4)	ATTENDING A SHOW (2)
MEETING FRIENDS/LOUNGING (3)	LIGHTING (2)
FEELING SAFE (3)	GARDENING (2)
EATING + PICNIC (2)	WALKING YOUR DOG (2)
	COVERING (1)

Figure 5. At a community design workshop, participants activated model alleys.

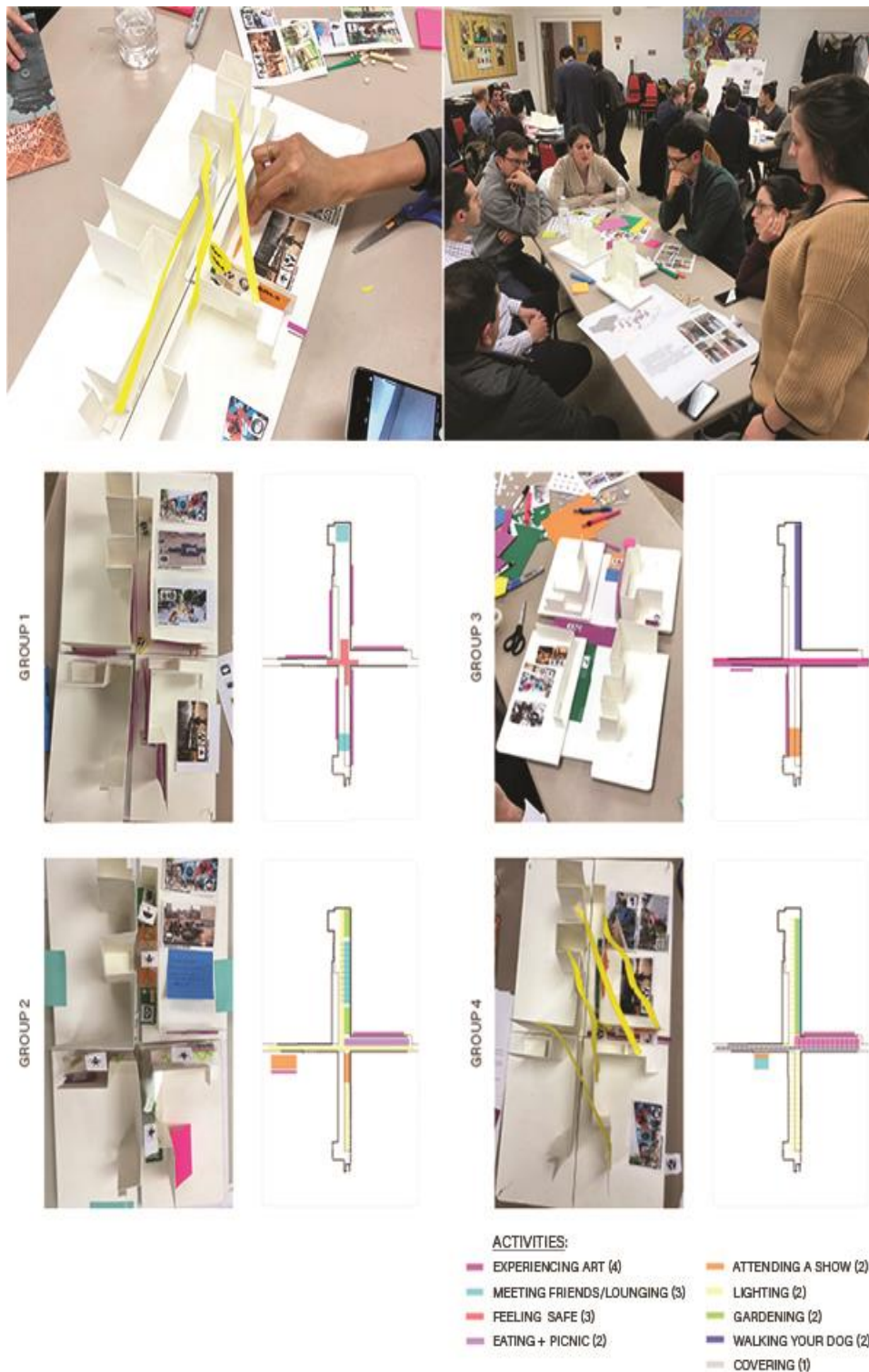## Community partnerships drive the design process

A few key community partners have been fundamental to the success of the development of the Prathers Alley Intervention:

- Mt Vernon Triangle Community Improvement District (MVTCID) has been the primary representative of the community's voice, drawing in a broad spectrum of both long-term and new

residents, small business owners, developers and community institutions including Mt Carmel Baptist Church. They have fostered relationships with municipal agencies with purview over public space and public programming in the neighbourhood, DDOT, Office of Planning, DC Arts & Humanities and the Mayor's Office

- ExposedDC has curated a robust and engaging rotating public art program that enlivens the alley experience
- FRESHFARM spearheads the community agriculture and food education programming and provided the performance specifications for the market stall

The inclusion of diverse voices has been vital to reinvigorating Prathers Alley. Engagement to understand the needs and desires of the Mount Vernon Triangle community with respect to the alley's activation started in 2018. Aa series of events – survey, focus group design workshop, and site visits – engaged the community in the project as it developed. The community engagement period had five stages:

- Identify (research) - this pre-design phase included unearthing the history of the alley, accessing materials including maps, census records, photo archives, newspaper articles, books and oral histories. This was also a critical period of discovery for understanding which city agencies needed to be consulted and what regulations and codes must be met
- Inform (survey) - the first of several surveys helped the team better understand how residents utilized the alley currently
- Community Design Charrette – at the charette community members used paper models of the alley to diagram potential activation form and program
- Concept Vote - the feedback from the charette was collated into three schemes, which were posted for a community vote in the alley. The winner - market stalls!
- Accessibility Site Walk(s) - these were focused group walk & talks where individual community members provided more nuanced and detailed input regarding the Market concept

Grantmaking as a driver of the design process

Also critical to the design process has been the identification of funding partners who have sponsored individual design components which link to their area of concern. The first of these was the District Department of Transportation who administers the city's Federal Transportation Alternatives Grant Program (TAP) funds. The TAP grant is an incentive to create safer pedestrian and cycling options, easing the burden on the road network and the environment. The second administered by the DC Office of Planning whose Streets for People grant is designed to encourage residents to get out and enjoy DC's downtown and public spaces in the wake of the COVID-19 shutdown. Each program's parameters impacted the way the alley activation was formed and implemented in specific ways

PRATHERS INTERVENTION – A NEW KIND OF PUBLIC SPACE
Traffic Calming

The initial intervention, which was made possible with the support of the federal Transportation Alternatives Program, was to convert the alley to one-way traffic and delineate a pedestrian corridor. Prathers Alley was already a popular cut through for pedestrians, bikes, and cars. The new plan allows people, cars, and delivery trucks to safely occupy the alley together.

Public Art

The public art component is supported by the DC Office of Planning Streets for People Grant, a program aimed at reviving the city's urban commons following the Covid-19 pandemic. The project highlights the alley as a place of great historical significance. The alley and its adjoining buildings

were once central to life for Mount Vernon Triangle's African-American community. To celebrate the living history of Prathers Alley, visual installations have been added to reintegrate and reactivate the space as an important civic asset.

The vinyl mural installation adorning the walls of 455 Eye Apartments & Lyric 440K Apartments pays homage to the former Northern Liberty Market, a cultural anchor of its time. Built in 1874, the market was one block north of the alley. In 1893, a hall was constructed above the market, structurally supported by the installation of large iron trusses. Throughout the 20th century, this hall was the center of various recreational and cultural activities, including bowling and movie screenings.

Today, images of the old, trussed hall serve as the inspiration for the vinyl graphics that line both sides of the alley. A perspective of the trussed arches aligns with key vantage points in the alley, projecting a view of the space that once was.

The murals are host to a rotating photography installation, whose inaugural curation highlights the intersection of history and daily life in Mount Vernon Triangle. By documenting the people, places, and moments that collectively define the neighborhood, the project honors the community's storied history while celebrating its continued evolution. The mural is further deployed throughout the neighborhood on MVTCID's wayfinding graphics.

Figure 6. Axonometric.

Figure 7. The vinyl mural hosts a rotating photography show.

Figure 8. The vinyl mural adorns buildings from disparate eras of the alley's development.

Mobile Market

A family of mobile market stalls brings activity and commerce to the alley. Capitalizing on a popular weekly farmer's market nearby, three of the stall types work together to support food preparation and instruction. The Wash stall has a kitchen sink with integrated filtration pump and water heater. The Cook stall has a power hookup for hot plates and a flip-up mirror for cooking demonstrations. The Sell stall has a pull-out storage bench and display screen for the sale of locally made goods.

Fundamental to the design of the mobile market is the appropriation of (public) space as they work in tandem to provide definition beyond their basic functionality. Mobility allows for a variety of positions to suggest various forms of viewing and instruction further supported by the extension of upswinging shading devices which visibility near and far as well as spatial definition.
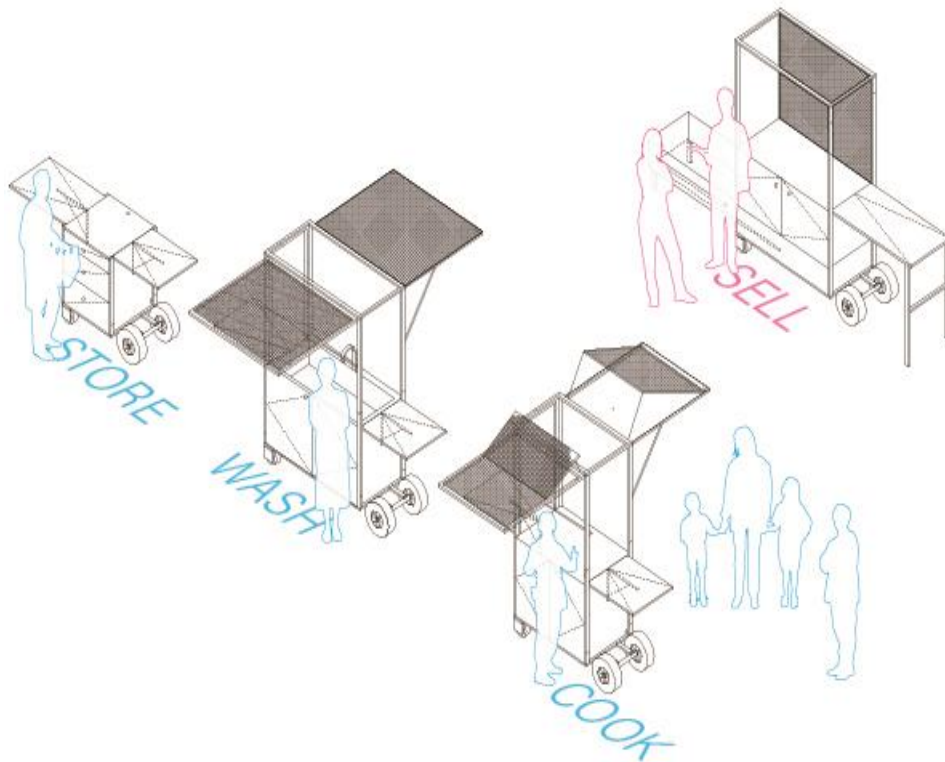
Figure 9. The market stalls are designed to work together to support a mobile demonstration kitchen and market.

Designed to be stored in a shipping container in the alley, the stalls unfold to add work surfaces and shading devices. All stalls are powder-coated steel frame, birch plywood, and stainless steel countertop.

Figure 10. The stalls debut during a holiday market.

CONCLUSION

The process by which the Prathers Alley activation has been developed, rooted in community engagement, presents a new way of conceiving public space – one that is inherently democratic and participatory. The design seeks, through the integration of public art, local commerce and slow-speed connectivity, to build the kind of multi-layered space that fosters community and conversation. But this process of design and implementation is not without its pitfalls.

Piecemeal funding can lead to missing pieces.

Design development, fabrication, and installation was implemented as funding was secured for each component. This has meant that several key design components are still missing as they lack funding sources, most notably the signature lighting that would enliven the space and make it possible to better view the photo walk by night.

Physical Security

The vision for the activation was to have the market stalls, which are made of durable powder-coated steel and can be reconfigured to create different street furnishing settings, live year-round in the alley space, inviting informal usage. However, out of security concerns – both vehicular and personal – the decision has been made to store them in a shipping container adjacent to the alley. This constitutes a missed opportunity for public engagement.

Overloading Project Partners

The novel nature of the Prathers Alley Mobile Market has required both project partners Mount Vernon Triangle Community Improvement District and FRESHFARM to stand up new programming. As non-profits with tight budgets, this has proved a challenge as they search for staff and funds to support programs. To date, three events have utilized the test–kitchen stalls with several more utilizing the market stall. As the two groups gain more experience with deploying the stalls, they will develop a better sense of how to build program funding into future budgets.

Post-occupancy survey

Conducting a post-occupancy survey and foot traffic study would provide key metrics for understanding the success of the intervention from a utilization perspective. This could not only inform future alley activation efforts but also allow the Mount Vernon Community Improvement District to adjust programming to suite the community's needs.

Albeit small in scale and scope, The Prather Alley Activation serves as a relevant example of a project of the LIVEABLE CITY though rigorous effort to seek the voices of many into a complex design proposal spanning multiple disciplines, partners and funding sources.

NOTES

[1] Richard Sennet. *The Spaces of Democracy* (Ann Arbor: University of Michigan, 1998).

[2] J.D. Dickey. *Empire of Mud* (Guilford, Connecticut: Lyons Press, 2014).

[3] James Borchert. *Alley Life in Washington* (Chicago: University of Illinois Press, 1982).

[4] DC Office of Planning. "Height Master Plan for the District of Columbia."

[5] Kimberly Prothro Williams, "Mount Vernon Triangle." (Washington, DC: DC Preservation League).

[6] DC Office of Planning and the Mount Vernon Triangle Alliance, "Mount Vernon Triangle Action Agenda" (Washington DC: March 2004).

[7] Tierney Plumb, "Veterans Affairs picks 425 Eye St. NW for swing space," *The Washington Business Journal* (May 28, 2010).

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DESIGNING INFRASTRUCTURAL ARCHITECTURE FOR SITUATED MULTI MODAL JOURNEYS: A REVIEW OF MOBILITY HUBS DESIGN PARAMETERS

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INTRODUCTION: AN URBAN DESIGN APPROACH TO DESIGNING SUSTAINABLE MULTIMODAL HUBS

Multimodal mobility hubs (MMH) are considered a key strategic tool to fulfill the purpose of developing integrated low-carbon transport systems: a panacea for solving transport-related issues[1] that should include public, non-motorized, and intermodal transport to reduce congestion and pollution, and improve connectivity, accessibility for all, health of citizens, the livability of the urban environment and general quality of life.[2] Walking and other active mobilities (cycling and micro mobility) are promoted as having distinct roles in the multimodal mix, especially for first and last mile connections.[3]

Taking a cue from the field of Urban Design,[4] designing for sustainable ways of moving is not limited to solving connectivity and accessibility aspects in nodal places and mobility networks, but must integrate site specific conditions and human sensorial experiences through consideration for a variety of user groups with different needs, interests and abilities.[5] However, much academic and grey literature on design parameters for mobility hubs foreground mostly instrumental aspects of the transport functions of hubs[6] overlooking the potential of understanding nodes as valuable and contributing public places and the importance of the human dimension – by extension the agency of the spaces we move within. This could produce stratified rather than unified design approaches that fail to unlock the potential of the hub as a tool for sustainability.

Remedying these perspectives calls for a situational understanding of nodes within transport networks as meaningful public places in a diverse landscape of neighborhoods foregrounding the different ways people journey within them.[7] Therefore, we argue that designing for increasing sustainable movement, specifically with the multi modal shift and the role of MMH in mind, should foreground the human perspective and the *multi modal situational journey*.

Furthermore, MMH are often ambiguous urban public spaces in their own right,[8] thereby calling for relational and transformative approaches to the urban design of mobility spaces or what has been framed as *'infrastructural architecture.'*[9] This calls for inclusive and place-based design approaches concerned with providing open, attractive places for mobility, urban and social activities requiring an in-depth understanding of the MMH's 'urban-ness,' 'public-ness', 'place-ness' and site-specificity. To that end we seek to answer the question: *What design parameters are important in the design of the multi-modal mobility hub as a facilitator of multi modal journeys?*

In doing so, this paper reviews literature and selected case studies on the role of MMH as a dynamo, to develop knowledge of the integrated aspects influencing sustainable modes of travel. The paper suggests a synthetization in a tentative conceptual matrix of design parameters across scales, that addresses the role of the MMH within its given context. The aim of the paper is to contribute to the development of an assessment methodology for the design of MMH's, with the wider perspective of improving the future success of MMH developments that will promote and strengthen pathways to sustainable urban mobility.

The result of this review is the preliminary step in an on-going work aiming to synthesize relevant design considerations applicable for the Interreg EU project 'Active Cities,'[10] which aims to increase and promote active mobility (walking and cycling) by putting people at the center of planning and design decisions. As a knowledge partner within the consortium, AAU (Aalborg University) aims to provide urban design knowledge for the assessment and re-design of selected pilot areas with the potential to become multimodal mobility hubs.

DESIGNING INFRASTRUCTURAL ARCHITECTURE FOR SITUATED JOURNEYS

Within the field of mobilities it has been established that mobility and the act of moving in and through space is a way of being in the world,[11] and not merely a mechanic and passive activity of going from A to B. Rather, the experience of the passenger on the move is the result of a complex succession of planned and unplanned decisions on the go, practices and interactions that are co-shaped and co-created by the passenger (knowledge, skills, past experiences, mobility literacy) and the environment.[12] In this sense, the journey of the passenger consists not only of discrete separable urban elements or artifacts (e.g. bench, sign, curb, lighting post, street, vehicle etc.) but rather of loosely joined and situational assemblages.[13] Accordingly, the MMH is positioned as a place where the encounter of different situated journeys take place.[14]

Jensen's and Lanng's mobilities design approach adopts situational and relational-processual perspectives to investigate urban mobilities beyond the mere functional understanding of the design of mobility spaces.[15] In particular, the concepts of the 'agency of artefacts'[16] and 'mobility affordances'[17] are relevant in the analysis of design features and characteristics of MMH and case studies. These two concepts invite us to pay particular attention to what things '*do*' in specific mobile situations beyond their instrumental functionality.[18] In particular, it aids an understanding of how designed artefacts assembled in a MMH form relations with other actors and networks and what practices and experiences they entice when people are moving through them. In this sense, it is key to investigate the temporalities of situated journeys because it allows designers to understand the complexity behind the passenger's mobility practices and interactions in and with space and place. Applying these concepts to the design of MMH, we conceptualize these as lively 'things' that entice multiple practices and experiences.

In addition, Jensen and Lanng advocate for a change in the way we define, understand and perhaps name mobility spaces as not solely spaces for transportation but as 'infrastructural landscapes' or architecture, which are "sites of interactions between socially heterogeneous groups and thus actually a vital part of the public spaces of the city."[19] In this regard, we work with the notion of mobility hub variation to understand the hub as both a transit node and place, and the intricated relationship and interplay among the *user*, the *node* and the *place* (Figure 1).
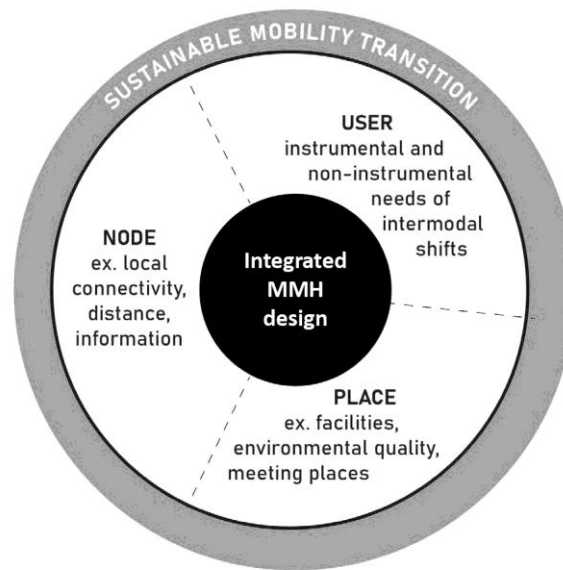
Figure 1. Intermodal Mobility Hubs by Ditte Bendix Lanng – adapted by the authors.

The following two sub sections outline a preliminary review of design parameters related to MMH.

Design parameters for MMH – preliminary literature review

The references reviewed are a compilation of academic and grey literature and case studies that were selected based on references given by two knowledge experts and from our own knowledge and past expertise within the topic of urban design and mobilities in transportation networks and mobility places.

Based on the reviewed literature we have identified three dominating perspectives relevant in the pursuit of tracing MMH design principles: one perspective has an instrumental character providing generic overviews of important design interventions in the design of mobility hubs (entailing a predominantly practical and functional perspective), while the other two foregrounds a human-centric and agency-driven focus encompassing the 'more than' transportation and efficient qualities of the hub by taking into consideration its role as an urban public space and its potential in accommodating mobility practices that enables a variety of everyday life activities. These perspectives are not mutually excluding but rather intertwine as well as they respond to different scales.
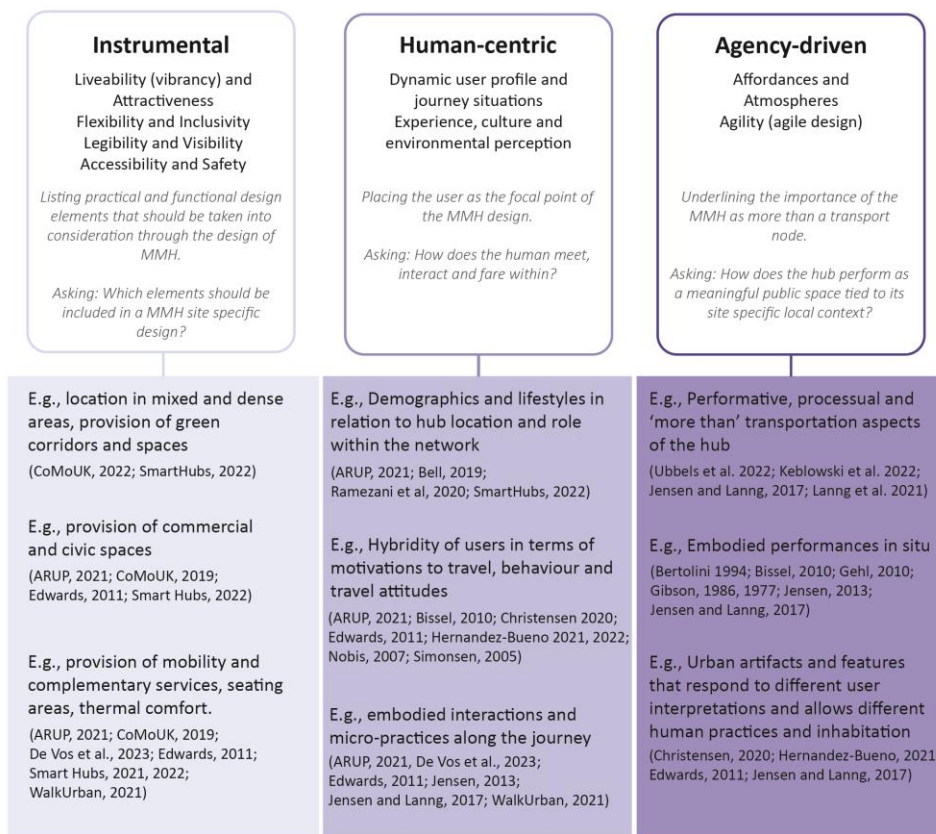
Figure 2. Summary of the literature review outlining the perspectives of Instrumental, Human-centric and Agency-driven aspects of the design of MMH. Source: Own.

Instrumental parameters

The MMH's instrumental parameters consider the incorporation of spaces and services that respond to both transportation and non-transportation activities.[20] The design parameters refer to providing visibility, accessibility, safety, flexibility, and vibrancy by incorporation of a variety of activities and green spaces while offering quality of materials (tactile performativity) and thermal comfort of the micro-environment. In addition, the literature foregrounds aspects such as the flexibility of hubs (allowing it to change over time) as well as the importance of creating a clear identity supplemented perhaps by a visual theme that bridges also to the digital integration of the hub in a larger IT network, which is turn also ensures digital accessibility.[21]

For example, Smart Hubs proposes the location of 'mobility modules' (charging and bike repair stations, bike parking) and 'complementary services' (Wi-Fi, WC, work/study stations, outdoor seating) as design principles for fostering modal shift in hubs.[22] The WalkUrban project defines metrics for walkability such as "crosswalks, visually active frontage, physically permeable frontage, shade and shelter, small blocks (length), prioritized connectivity."[23] For transport interchanges, Edwards refers also to the provision of active frontage, creating clear visibility to transport modes, the design of well-lit spaces and clear sight lines to aid passengers' wayfinding.[24] He defines also key principles for a good integration of the hub with the urban space such as safe and secure routes for pedestrians and bikes, the integration of commercial and civic areas and visible connection to other modes of transport and civic landmarks.[25]

Human-centric parameters

The human-centric parameters comprise not only the user's needs, travelling conditions (travelling alone versus with a companion, family or friends, according to the weather conditions) and types of journeys (to work, school, recreation), and demographics (age, gender, income, educational level), but also the passenger's lifestyles, experiences and spatial perception (e.g., easy to use and modal shift, safety during day and night, cleanliness, waiting time, crowding level),[26] urban and mobility literacy (knowledge using transportation systems) and emotions along the journey (motivations to travel, meaning of travelling).[27] Particularly previous experiences and knowledge about using and inhabiting public transportation have a strong correlation to the perception of 'seamless' travel experience[28] and the willingness to use other forms of transport and MMH.[29] This points to "dynamic profiling"[30] – meaning the shifting of passenger's roles and profiles during the same journey—[31]which acknowledges the changeability of users based on the agencies of the hub: situations and interactions that are multiple, changeable and unpredictable.[32] Some literature seeks to develop operational user-profiles associated with various needs, interests and capabilities that may serve as examples of the different life phases users go through,[33] and travel attitudes,[34] while other directly links different profiles with the practice of journeying, thus foregrounding the trajectories within the urban landscape.[35]

Agency-driven parameters

The agency-driven parameters refer to the affordances of the MMH that makes it a performative, transformative and processual urban space. From a network standpoint, it is argued to consider a wide-range of socio-technical aspects to achieve sustainable urban transport beyond rational understandings of models and people's behavior.[36] Additionally, it is argued that the location of the hub typology is based on its *role* within the network, thereby acknowledging its site-specific performativity and agencies.[37] Specifically Jensen and Lanng argue for paying attention to the 'non scripted' human practices in space, in particular what voids, surfaces and spatial conditions entice (e.g., screaming, smelling, running, talking).[38] Edwards Others argue that the interchange concourses and passageways accommodate programmed and unprogrammed passenger's practices thereby creating 'open' spaces.[39] Based on an analysis of interchanges, a "three-dimensional planning" and design is presented, which means designing from the eyes of the passenger to achieve vibrancy, legibility and performativity by considering the co-dependency of city and the hub.[40] As Edwards puts it "The dictum that 'form follows function' should be modified at interchanges into 'form and function follow movement'"[41] and site-specificities.

Case review examples of MMH

Three distinctive hub variations were selected as cases for this review: Luchtsingel in Rotterdam, Holland; Nørre Snede, in Denmark (both cases are established); and the design proposal for a multi-modal hub Gigantium in Aalborg, Denmark (future design scenario). The cases will be presented and discussed in brief by activating the previously outlined perspectives of instrumental, human centric and agency driven (see also figure 2).

In Rotterdam, the Netherlands, the Luchtsingel project establishes connections via a pedestrian wooden bridge across the downtown station area with public transport (busses and trains). The case exemplifies a city centre hub within a dense urban setting. The Luchtsingel – an elevated yellow-signature pedestrian crossing – accentuates the bustling dynamics below the bridge, and allows new accesses across huge traffic arteries, as well as views of the local area. In the case of Nørre Snede, a village in the middle of Jutland, Denmark, with around 2000 inhabitants, the local station area functions as a smaller local hub which services regional bus routes that connects the village with the

surrounding territory.[42] In Aalborg, Denmark, the design scenario for the suburban Gigantium hub exemplifies the potential transformation of an existing commuter parking space situated on a left over slope within a green wedge on the fringe of the inner city into an multi-modal mobility hub for cars, busses, bikes and pedestrians, servicing the surrounding neighborhood planned to expand in the years to come.

LUCHTSINGEL	NØRRE SNEDE STATION	GIGANTIUM
ROTTERDAM, HOLLAND *Completed* *City centre hub* *Architect: ZUS*	**NØRRE SNEDE, DENMARK** *Completed* *Rural hub* *Architect: unknown,* *Ikast-Brande Municipality*	**AALBORG, DENMARK** *Design scenario* *Regional and neighbourhood hub* *Architect: Grandville & Urban Creators* *Aalborg Municpality, NT & Vejdirektoratet*
INSTRUMENTAL ASPECTS		
Functions: 1:1 statement in itself, offers new ways of moving, first and last mile solution, signages on ground leading **Legibility and visibility**: Architectural landmark, yellow signage, spectacle **Access and safety**: difficult to access, pedestrian oriented **Multi-modal**: prioritize walking but connects to public transport (trains and busses)	**Functions**: places for sitting, new signages **Legibility and visibility**: the use of colors and furniture as identify markers **Access and safety**: easy to access, good lightning conditions, seperates places to stay from zones of movement **Multi-modal**: prioritize the shift between transport forms from walking and cycling to public transport (busses)	**Functions**: places for sitting, cycling maintenance, small kiosk, package delivery, play, lightning **Legibility and visibility**: with its green character the hub inserts itself into the existing environment **Access and safety**: actively seeks to ensure safe journeys across multiple modalities. Paths and crossings are moderated **Multi-modal**: prioritize the shift between private to public transport forms inlcuding also walking and cycling into the mix
HUMAN CENTRIC		
Sensitive to the human scale Tactile: activating the senses	Attention to the human scale - subtle changes The design interventions meets the scale of the village	Enable new accessibility for soft mobility Attention towards multiple users: functions vary from staging views, ensuring waiting to play.
AGENCY		
Transforms the station area to a multi experiential place Offers new ways of moving (connects) Performative Architecture - experience while moving	Upgrades an existing transit area with known tools that betters conditions for resting; a modest transformation embedded within a rural context	Offers new possibilities for waiting and accessing new kinds of modalities (eg. busses). Particularly enable walking and cycling. Emphasizes the landscape qualities with extensive greening

Figure 3. Three mobility meeting hubs; respectively Luchtsingel, Rotterdam (photo: Ditte Bendix Lanng); Nørre Snede, Denmark (photo: Ditte Bendix Lanng) and design proposal for Node, Gigantium Aalborg (rights: Grandville studio). Images are used with permission.

When it comes to the instrumental perspective as outlined based on the literature review, the cases in various ways add *functions* that transcend a transport objective. In Aalborg, the proposed re-design activates the green setting with waiting, bicycle maintenance and package delivery facilities. In terms of *visibility* Luchtsingel is a clear performative architectural landmark in itself – towering above the urban setting below, while also the Nørre Snede transformation apply significant semiotics through the use of e.g., color and urban furniture. When it comes to *flexibility* especially the Aalborg case entails a processual element through also short-term pilot actions, that would help decide on the final programming and design elements integrated in the hub.

Each case addresses the human-centric perspective of foregrounding different users and their multiple capabilities and aims for journeying as pointed to in the literature. In Nørre Snede the hub caters mostly to everyday commuters recognizing that the place is deeply rooted in a small community and establishes a local meeting point, a local wayfinding system, and design solutions that cater to the waiting situation. In Aalborg, the user groups and modalities are diverse, from the commuter travelling out of the city to the resident travelling into Aalborg to shop. The re-design of the hub focuses on offering accessible connections between modalities in a design proposal that activates the

topography, views and greenery thus catering for not only transportation needs but also sensorial impressions of the body on the move.

When it comes to agency of hubs, all three cases in diverse ways seek to push for new ways of adding value to the local public space. The Nørre Snede case adds new forms of agency, that expand the possibilities of the existing hub – with an emphasis on making accessible the modal shift between soft mobility and the collective bus transport while also establishing a clearly identifiable public space through the careful re-design with furniture and signages, that establishes a clear identity. Whereas the Aalborg case adds new possible modal shifts through the integration of regional bus routes, walking and cycling via newly established routes that connects the site with the surrounding urban landscape while also working actively with the atmospheric green and landscape experiential qualities on site, making a small destination in a network of journeying. Thus, adding new value and meaning to the site. The Luchtsingel case is in its agency perhaps the most novel in its clear architectural statement that establishes an experientially rich infrastructure, that was not there before.

During the case review, we also found the multi-scalar dimension of the cases as an important and relational aspect across the instrumental, human-centric, and agency-driven aspects, which showcases them as places that are part of a larger (urban) network. Further, other agency-driven parameters were found: the tactile affordances provided by the distinctive materiality of the places thereby enticing different urban practices and movements; and the processual flexibility foregrounded by 'experimental' attributes allowing the places to adapt based on site-specific practices of appropriation. These aspects will be integrated in the tentative matrix in the following section.

MATRIX OF DESIGN PARAMETERS

Previously we provided an overview of relevant literature and case examples that suggest an initial understanding of perspectives, which are relevant in the design of MMH. This serves as a first step in developing a matrix for design parameters that acknowledges the site-specific conditions of MMH and its imminent and integrated urban (role) and place qualities.

Figure 4 shows the matrix of design parameters for MMH integrating the instrumental, human-centric, agency-driven and multi scalar aspects, as shown in the case review. In this regard, the situational multimodal journey is seen from the passenger perspective and across three scales: the Micro-scale (referring to the architectural features of the hubs), the Local-scale (addressing the public space scale of the hub) and Network-scale (addressing the hub variation within the city network).
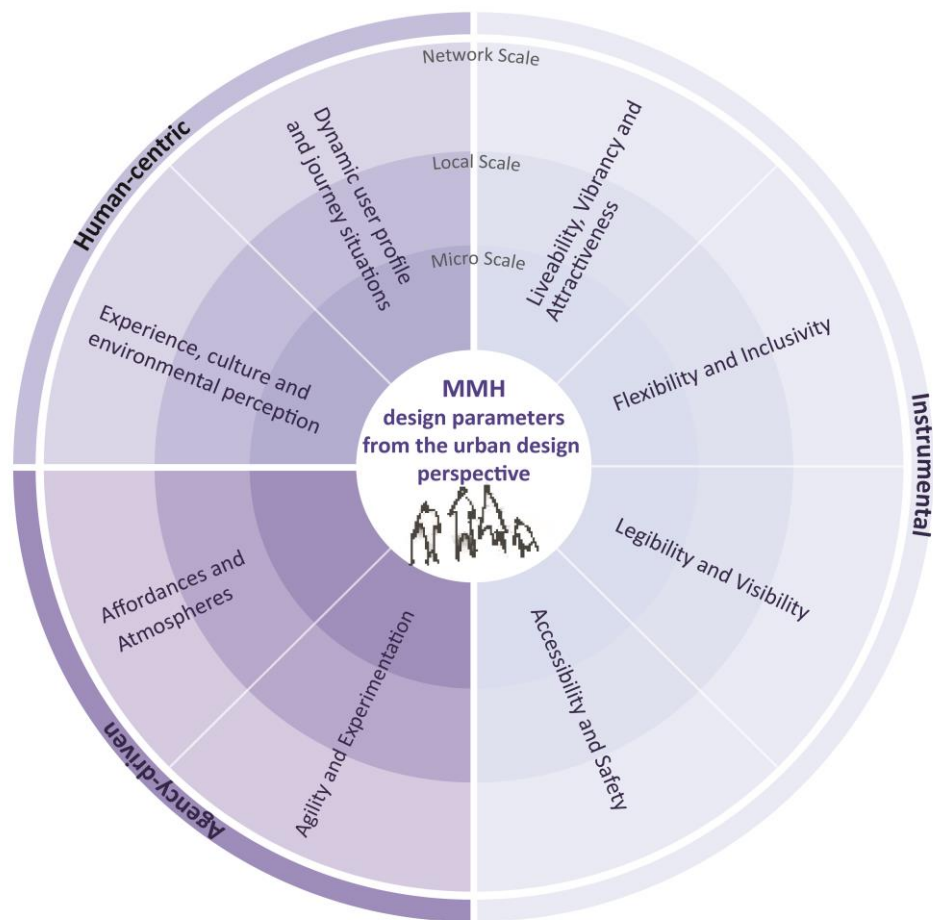
Figure 4. Model of Design parameters for MMH from the urban design perspective.

The instrumental dimension comprises five parameters: Livability, Vibrancy and Attractiveness; Flexibility and Inclusivity; Legibility and Visibility; and Accessibility and Safety. The human-centric comprises two parameters: Dynamic User profile and journey situations; and Experience, Culture and Environmental Perception. Finally, the 'more than' functional dimension include two parameters: Affordances and Atmospheres; and Agility and Experimentation.

CONCLUSION

This paper contributes overall to the discussion on the role and design of mobility hubs within the sustainable mobility transition. It offers a tentative model for MMH which combines relevant design parameters based on the review of selected literature and cases by adopting an urban design perspective.

The model integrates a combination of instrumental-oriented, human-centric as well as agency-driven perspectives that may promote the understanding, evaluation, and re-design of the MMH within multi-modal situational journeys. We suggest the integration of the perspectives into a tentative model of integrated design parameters for MMH development. Albeit represented separately in the model, the design parameters cannot be understood in isolation but rather in relation to other site-specific and processual urban and social conditions and also includes multiple scales experienced from the human perspective on the move. The tentative model underscores the need to pay attention to and integrate 'the more than' instrumental aspects (agencies) of MMH in its local setting and the temporalities of the situations that unfold within them.

The model is part of on-going work within the Active Cities project. The findings and frameworks developed in this paper form a starting point for further systematic review of relevant literature on MMH development and assessment with the aim of qualifying the model and activating it as as a tool for evaluating the role of the MMH as a dynamo for facilitating sustainable journeys across different pilot sites. To that end the model needs further qualification considering also processual, time sensitive as well as involvement aspects of establishing MMH, that are not addressed in this paper.

NOTES

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UNDERSTANDING THE ROLE HUMAN-ENVIRONMENTAL RELATIONS PLAY IN SHAPING THE SOCIAL IDENTITY IN AN URBAN CONTEXT

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ABSTRACT

Old cities possess an inherent organic quality that imbues them with a distinct character, rendering each space inimitable from the other. This quality seems to be lacking in today's cities thereby creating a series of monotonous spaces that is devoid of any identity. Through this study we try to understand what parameters define the identity of a space, what gives it a sense of character and how this can be integrated in future city designs.

According to David Canter, the identity obtained by a space is not merely the outcome of its physical attributes but rather the result of the activities revolving around the space and thus the conception of the place embedded into the minds of people. Once this relationship is established, the paper explores on how these places interrelate to one another on a macro level to form a series of patterns. These patterns further grow in an organic manner that cannot be purely defined by its physical attributes but rather by social interactions and participative process.

This brings about the concept of 'Socially Restorative Urbanism' which places human experience at the forefront of how urban places are designed. It emphasises the importance of local communities in the process of urban place making by using participative process to address the imbalance in territorial relationships along transitional edges giving rise to a more human-oriented framework for designing urban spaces.

Furthermore, these theories are used to understand the contrasting difference between the quality of spaces in Old Delhi, characterized by its organic essence, and New Delhi, where the spaces lack context and seem monotonous.

WHAT DEFINES A SPACE AND SHAPES ITS SOCIAL IDENTITY?

While a space may have physical dimensions, it is intensity that gives place its potency and its primacy.[1]

A place is a more holistic concept governed by the relationship between the physical environment, human activities, user group and what is perceived from it. It goes beyond physicality and is characterized more by public interaction by various user groups, and how they occupy and further adapt it to their needs. In other words, a space inhabited and occupied by people, giving it a sense of identity, makes a space a place. While space is a physical entity that is static in nature, a place is more

dynamic, constantly changing based on who interacts with it, how they interact and what is conceived of the space.

This relationship is explained in David Canter's Book, Psychology of Place. He believes that a place is a result of the relationship between actions, conceptions and physical attributes. It follows,

a. What behavior is associated with it.

b. What are the physical parameters of that setting.

c. What people conceive of that behavior in that physical environment.

This tells us that the way each place is molded gives rise to the type of activities inhabited in these spaces thus giving it a certain conception. From the picture below one can see a contrasting difference in the way people inhabit and activate a space based on slight changes in the interior spatial organization leading to a unique conception of each space. (Figure 1)

Figure 1. Socio-spatial configuration of spaces

To describe the places which exist in any given area, it is necessary to identify also the people who are using that area, their conceptions and activities.[2]

The identity of a place depends not only on its physical attributes, but largely on the activities and behavior of its inhabitants. Therefore, it is primarily the individuals and their behavioral activities within a space that create a preconceived notion of the place, establishing its distinct identity.

HOW DO THESE NETWORKS OF SPACES EXPAND ON AN URBAN LEVEL?

At the urban level, these different spaces interact with each other, forming a network of interconnected spaces that expands further in response to the needs of the people and community. According to Christopher Alexander's book – A New Theory of Urban Design, he saw cities as living organisms that grew and evolved naturally over time.

"When we look at the most beautiful towns and cities of the past, we are always impressed by a feeling that they are somehow organic" [3]

He believed that older traditional cities possess a sense of 'organicness and wholeness' that does not exist in cities today. They have a unique cultural and historical identity that cannot be replicated through physical features and structures but instead focuses on human needs and desires, creating spaces that support and enhance the well-being of individuals and communities. These spaces allow for diversity in architectural form and function, adaptability and flexibility in design allowing spaces to evolve and accommodate different activities catering to the needs of the people that change over time.

As cities grow over time, they do so through a process defined as 'incremental growth' where spaces grow as a 'whole' that brings about the organic sense of a space.[4] This growing of 'wholes' follows certain fundamental features as mentioned below;

a. The whole grows bit by bit or as a piecemeal.

b. The growth of this whole is unpredictable. It is never clear how it grows and where it ends.

c. The whole is coherent. It is never fragmented into separate elements but rather connects to one another in a complex system.

d. It is full of feeling and connects with the people bringing about a certain character that cannot be defined by physical features alone.

It is this sense of socio-spatial relationships that gives character to a space. These types of spaces cannot be planned without understanding the context of the place in terms of history and culture and the way local communities interact with the space.[5]

All ancient traditional cities seem to have this feature in their growth but modern planned cities of today lack this sense of organic growth as a 'whole' thus losing its identity, creating monotonous repetitive spaces. The rigidity and restrictions at which urban developments are planned today, focusing purely on aesthetics and function moves away from the human-centric design of cities that used to exist earlier. This brings about the need for a more participatory approach to urban planning, involving communities in decision-making processes.

Alexander's work explored the relationship between people and their social environment. He believed in moving away from the physical features and structures that constitute a space and instead focusing entirely on the way people interact with them. The way people behave in a space also depends on the social hierarchy that defines this place in terms of 'public-ness and private-ness'. This brings us to the concept of territoriality and ownership of space.

HOW DO PEOPLE INTERACT AND BEHAVE WITH DIFFERENT SPACES?

The concept of 'place' is generally acknowledged as capturing human behavioral and emotional attributes, but once transposed into mainstream professional architectural and urban design contexts it remains far too narrowly form-centric where it fails to capture the complex nature of territoriality reflecting authentic lived experience.[6]

There is a much more multi-dimensional understanding of the way people interact with places thus giving about a sense of ownership and territorialism. Some places make people feel more connected to it while others lack this sense of belonging. Moreover, human behavior in space is also closely related to the spatial quality and ownership that one has over this space.

The dimension of territorialization/deterritorialization is that through which social and spatial boundaries and identities are inscribed and erased.[7]

To understand this inter-relationship between social and spatial boundaries we first explore the way people interact with different spaces based on their spatial quality and how this difference in behaviors creates a change in the social identity of each space.

This brings about a new concept defined as 'Socially Restorative Urbanism' which explores the idea of how people and communities should have more control over how and what their urban environments should become. It proposes a design framework where human experience is at the forefront of how urban places are made and experienced. It relies on the importance of local communities and participative process in urban place making as opposed to pure aesthetics and functionality.

Socially restorative urbanism in essence, has two mutually interdependent concepts: Experiemics – a participative process that acts to redress imbalance in territorial relationships; and transitional edges – a socio-spatial concept of urban habitat.[8]

Experiemics is a conceptual tool used to understand and evaluate the different territorial ownership of spaces by people characterized as MTOY (Mine, theirs, ours and yours) as stated in the book – Socially Restorative Urbanism. This helps us understand the socio-spatial quality of spaces by identifying how people interact with them in terms of ownership and how this moulds the character and social identity of spaces making each one unique to the other. (Figure 2)

Figure 2. Graphic representation of ownership of spaces

Transitional edges explore the socio-spatial quality of the urban morphology of a space and tries to understand how spatial structure relates to the social identity of a place. The factors that define a transitional edge are further summarized in the following points;

a. Social activity
b. Public-private gradient and social interaction within this gradient
c. Hide and reveal - balance between private spaces and social interaction
d. Spatial expansion formed by overlapping adjacent spaces
e. Enclosure
f. Permeability and transparency – Fluidity and access between spaces
g. Territoriality - Ownership
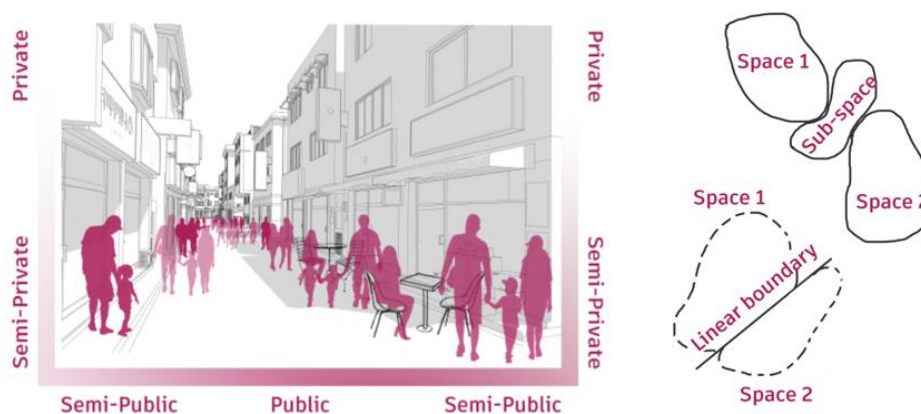h. Looseness – Flexibility and ambiguity. (Figure 3)

Figure 3. Transitional edge

To understand what impact these factors have on an urban context and how they define the social identity of a space a comparative analysis is done between New Delhi and Old Delhi in the next chapter.

CASE STUDY – COMPARATIVE ANALYSIS BETWEEN NEW DELHI AND OLD DELHI
Introduction to the site

Delhi is in north-central India and is the capital city. Delhi is divided into two main parts; Old Delhi in the north which is the main historic city and New Delhi in the south which was designed by the British during the colonial times.

Old Delhi also known as 'Shahjanabad', founded by the Mughal Emperor Shah Jahan, is the most historic part of the city, which served as the capital of the Mughal Empire during the 17th century.[9] It is known for its narrow lanes, bustling markets, and historical and cultural landmarks. The spaces reflect on the historical identity that is infused within the urban fabric of Shahajanabad bringing about a strong identity to the space related to the local context.

In contrast, New Delhi was designed by the British architects Edwin Lutyens Herbert Baker during the colonial rule in the 1920s and 1930s when it was inaugurated as the new capital of British India.[10] New Delhi is characterized by wide tree-lined avenues, spacious parks, and grand colonial-era buildings. It represents a more modern side of Delhi imposing a colonial style of architectural design to create a grand space largely defined by aesthetics without considering the local context and communities.

This disparity in the way the spaces were designed created a huge gap not only in the socio-spatial quality of space but later over time in the groups of people that would occupy these spaces.

Comparative Analysis
Macro Level Study

On a macro level New Delhi shows a more rigid and strict layout which leads to a more restricted and formal growth. From the plan below (Figure 4) we can easily identify and demarcate strong separate spaces with strict boundaries leading to fragmented and separate spaces. The usage of wide broad lanes to segregate spaces and functions acts as strong boundaries between private and public spaces.

The street layout follows a grid at 90, 60 and 30 degree angles along concentric circles with a more structured growth as it expands[11]. The rigidity in the way these spaces are designed here restricts people from using spaces for their needs hence the space loses its original character.

Figure 4. Plan layout of New Delhi. Image Source: Author

Due to these strong distinct divisions between public and private spaces there is a lack of the public-private gradient that could have allowed for more social interactions and permeability between spaces. The growth of the 'whole' is through a strict planned method that does not provide the opportunity for people to feel connected to the space thereby creating large monotonous open spaces that are aesthetically pleasing but lack social quality.

Old Delhi on the other hand grew in an organic manner allowing for a more dynamic use of space.[12] The spaces and streets are laid out such that it allows people to use it based on their needs and creates

a more human-centric design. Spaces here adapt and change based on the needs of the residents. As you can see from the plan below (Figure 5) the pathways grow in an unpredictable irregular organic manner that cannot be planned out but rather interacts with different spaces to create a coherent design – like the growth of an organism as mentioned in New Theory of Urban Design. Unlike New Delhi which had fragmented spaces separated by broad lanes and roads, here there is a sense of fluidity between the spaces to create a coherent network that seems to be growing in a 'piecemeal growth'.

Figure 5. Plan layout of Old Delhi. Image Source: Author

The narrow streets create opportunities for people to interact and form informal social gathering spaces. There is a sense of gradient in the spaces from private to public allowing people to use spaces based on their needs creating dynamic adaptable spaces. There are no strong boundaries separating spaces but instead the sense of transitional edges that allow for permeability in spaces and functions. There is a stronger social quality to the spaces here that evolve based on the needs of the people rather than being restricted by the physical features.

Micro Level Study

When zooming in on a micro level to understand the socio-spatial configuration of spaces and how people interact, we begin to see how a distinct social identity is infused in each of these spaces based on human behavior.

In New Delhi the broad lanes and large open green spaces along with the private closed houses gives no sense of coherence between spaces and does not create opportunities for people to have ownership of these spaces thereby moving away from a human-centric design to a more functional space purely governed by the physicality restrictions. There is no gradient between public and private spaces but rather distinct separate spaces not allowing for social interactions to take place. There is no concept of 'their or our' space but only 'mine' and 'yours'. There is no flexibility in spaces that could have allowed for adaptable use of spaces but instead it is the physical features that define the space rather than the social aspects. The images below take into consideration a few of the street views in New Delhi and the social configuration of these spaces. (Figure 6)
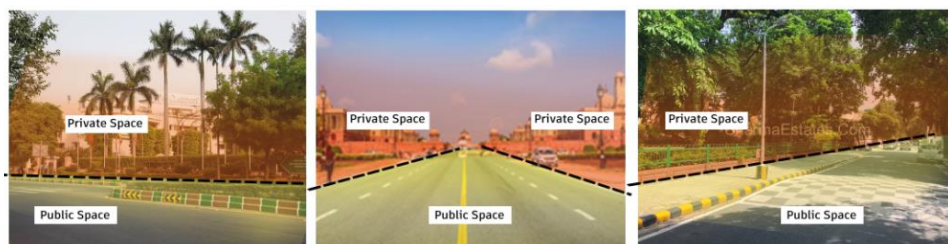
Figure 6. Social Configuration of spaces in New Delhi. Image Source: Edited by author, photos from Google.

We can see that there is no transitional movement from one space to another but only separate fragmented pieces that cannot interact with each other. The section below (Figure 7) shows the strong separation between spaces due to these wide lanes that do not provide opportunities for social interactions but rather strict spaces with predefined functions restricting fluidity in space.
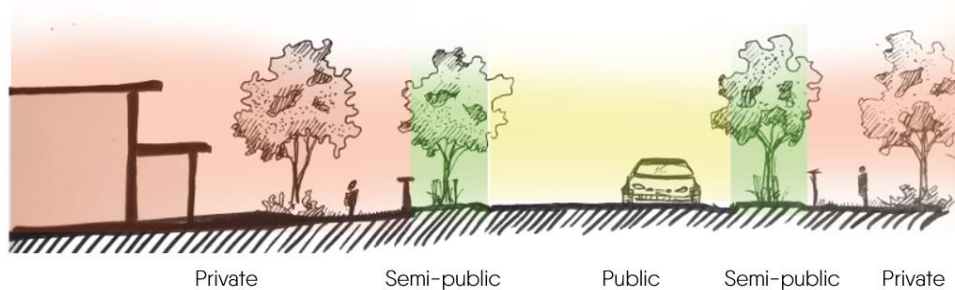
Figure 7. Section along a residential street in New Delhi drawn by author.

In Old Delhi on the other hand, when we take a closer look, we can see that the spaces are more fluid and allow for change as per what people want to make of the space. There is a certain level of ownership and control of these spaces by the people thereby creating a strong social quality to the space as opposed to New Delhi. There are no bold boundaries between private and public spaces but a fluid gradient between public and private spaces allowing a certain permeability between these spaces. In the pictures below (Figure 8), the semi-public spaces are used by people to allow for social gatherings which can change over time based on what people need. The same space during festivals is used to gather and celebrate by the people of the community creating a sense of 'our' space. This sense of ownership and control of the space by the community is lacking in New Delhi.
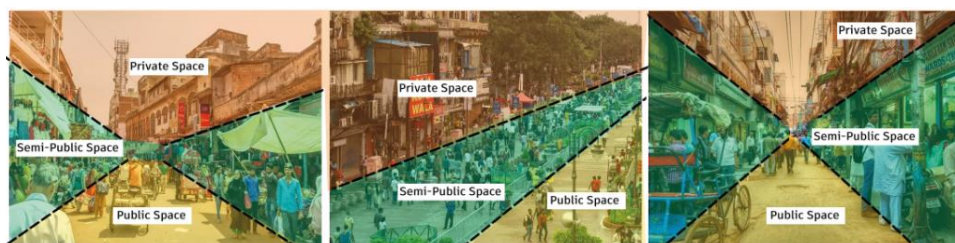
Figure 8. Social Configuration of spaces in Old Delhi. Image Source: Edited by author, photos from Google

The section below (Figure 9) shows a basic layout of a commercial street in Old Delhi. The layout follows narrow streets that combine with smaller nodes to create a network of interconnected public spaces. Where different spaces intersect, sub-spaces are used to transition from one to the other creating a fluid movement through spatial expansion. The spaces lack strict boundaries but instead have a more dynamic private-public gradient allowing for more ownership of spaces by the local communities.
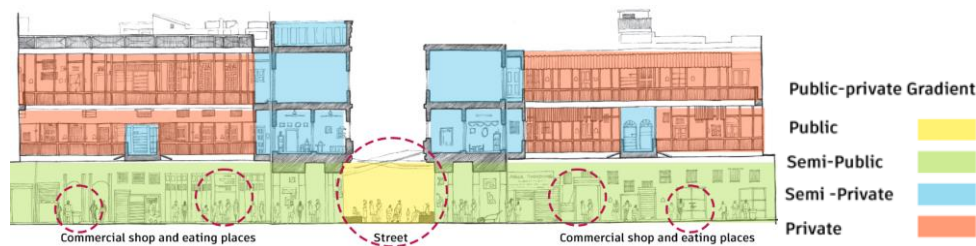
Figure 9. Section along a street in Old Delhi drawn by author

The section below (Figure 10) shows residential spaces situated between two different courtyards within Old Delhi's street. The spaces here transition from private to semi-private to semi-public to the street which acts as a public space thereby creating a network of interconnected spaces. The interior private spaces act as 'mine and yours' while the courtyard and street spaces act as 'ours or theirs' creating a sense of ownership within these various spatial configurations.
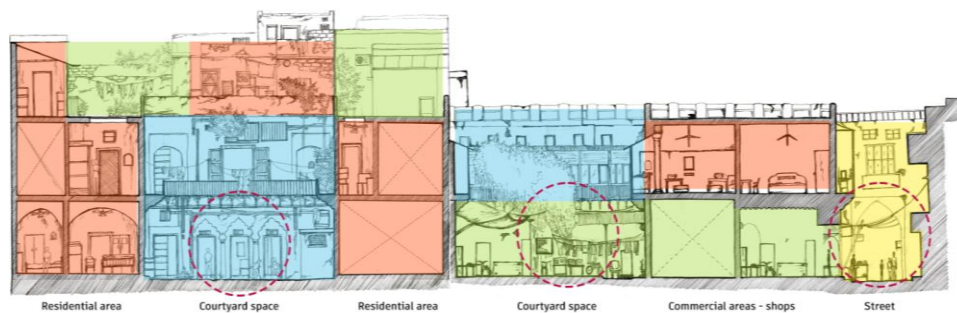
Figure 10. Section along a street in Old Delhi drawn by author.

CONCLUSION

When spaces are designed purely looking at physicality, they are isolated and fragmented creating monotonous spaces that do not grow as a 'whole'. On the other hand, spaces that are interconnected with one another in terms of social quality have a transition from one space to another in an organic sense allowing people to have more ownership within these transitional spaces. It creates fluidity in the way people use these spaces, enhancing its social quality.

For example, in New Delhi we see a series of privatized spaces that are separate from one another while in Old Delhi each of these private spaces transition from one to the other through semi-private and semi-public spaces creating a network of spaces that can grow in an organic sense thereby enhancing the socio-spatial quality. There are defined bold edges between spaces in New Delhi while in Old Delhi these boundaries slowly disappear as people adapt and use the transitional spaces.

This lack of ownership within the transitional spaces in New Delhi creates a more rigid restricted format of growth thereby losing its cultural and social value. The space lost its identity when it was redesigned without taking into consideration the context and local communities. The urban fabric was completely changed thereby creating this massive contrast between Old Delhi and New Delhi.

Thus, we can conclude by emphasizing the importance of participative process and local context in enhancing the socio-spatial quality of spaces. Spaces need to be designed to allow communities and people to use them according to their needs, allowing for more socially strong spaces as opposed to physically aesthetic ones.

NOTES

[1] Kim Dovey, *Becoming Places Urbanism/Architecture/Identity/Power* (London: Routledge Taylor&Francis Group, 2010), 7

[2] David V. Canter, *The Psychology of Place* (London: Architecture Press, 1977), 150

[3] Christopher Alexander, *A New Theory of Urban Design* (London: Oxford University Press, 1979), 23

[4] Christopher Alexander, *A New Theory of Urban Design* (London: Oxford University Press, 1979), 31

[5] Kim Dovey, *Becoming Places Urbanism/Architecture/Identity/Power* (London: Routledge Taylor&Francis Group, 2010), 34

[6] Kevin Thwaites, *Socially Restorative Urbanism: The theory, process and practice of Experiemics* (Abingdon: Routledge Taylor&Francis Group, 2013), 22

[7] Kim Dovey, *Becoming Places Urbanism/Architecture/Identity/Power* (London: Routledge Taylor&Francis Group, 2010), 28

[8] Kevin Thwaites, *Socially Restorative Urbanism: The theory, process and practice of Experiemics* (Abingdon: Routledge Taylor&Francis Group, 2013), 36

[9] Rana Safvi, *Shahjahanabad: The Living City of Old Delhi* (India: HarperCollins, 1996), 30

[10] William Dalrymple, *City of Djinns* (Delhi: Penguin Books ,1993)

[11] Lakendra Kumar Jain, *Delhi Roads: a Pedestrian Nightmare* (Delhi: Lambert Academic Publishing, 2013)

[12] Alan Rubin, Delhi Streets – One day in the streets of New Delhi (New York: Blurb, 2014), 41

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REFUGEE CAMPS IN JORDAN AS LIVABLE CITIES

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INTRODUCTION

The world is currently facing the largest refugee crisis in history, with an estimated 79.5 million forcibly displaced people worldwide. Jordan is one of the countries most affected by the crisis, hosting over 2.8 million registered refugees, the majority of whom live in camps.[1] These camps have traditionally been viewed as temporary solutions to a crisis, providing basic needs such as shelter, food, and water, but lacking in terms of livability. This paper argues that refugee camps in Jordan have the potential to transition into dynamic, adaptable urban ecosystems from temporary shelters while reconsidering the role of refugees in exercising ownership of their spaces.

HISTORICAL BACKGROUND OF REFUGEE CAMPS

Refugee camps have historically been viewed as temporary solutions to humanitarian crises and natural disasters, with a focus on providing basic needs such as shelter, food, and water. However, these temporary solutions have often lasted for decades, resulting in the development of distinct communities with their own social dynamics and cultural practices.[2] These communities have been shaped by the refugees themselves, who have taken ownership of their spaces and transformed them into livable communities.

Jordan hosts almost 3 million registered refugees from Palestine, Iraq, and Syria.[3] The majority of these refugees live in camps, which have evolved over time from temporary shelters into more permanent settlements[4] which have become home to generations of refugees, with some camps existing for over 70 years.[5]

The current form of refugee camps dates back to the early 20th century, particularly in response to conflicts and humanitarian crises that resulted in large-scale displacements. Such emergency shelters were deployed based on the United Nations High Commissioner for Refugees (UNHCR) handbook guidelines from 1982. These camps, including those in Jordan, have served as essential spaces for providing shelter, protection, and basic services to refugees. Emergency humanitarian settlements as the case of refugee camps aimed to provide immediate relief and support to displaced individuals until they could be resettled or repatriated. The temporary nature of these camps was emphasized, assuming that displaced populations would eventually return to their homelands.[6]

Over time, the temporary nature of refugee camps became more complex due to prolonged conflicts, political instabilities, and challenges in finding durable solutions. This shift led to the emergence of protracted refugee situations, where camps continued to exist for extended periods. The Palestinian refugee camps established in Jordan after the Israeli occupation in 1948 are significant examples of

such situations.[7] The evolving nature of conflicts and political complexities transformed the concept of temporary camps into long-term settlements, with subsequent impacts on the design and management of such spaces.

THE LIVABILITY OF REFUGEE CAMPS

Due to poor maintenance and lack of funding, refugee camps face numerous challenges in providing adequate living conditions for residents. Overcrowding, limited access to clean water and sanitation facilities, and insufficient healthcare services were among the prevalent issues.[8]

The concept of "livable cities" within refugee camps focuses on promoting social cohesion, sustainable infrastructure, and economic opportunities. Initiatives in Al-Za'atari Refugee Camp in Jordan have incorporated urban planning principles to create functional and inclusive spaces, including marketplaces, schools, and recreational areas.[9] These efforts aim to transform camps from mere temporary shelters into dynamic communities that foster inclusion and self-reliance.

A study by Carpi and Fiddian-Qasmiyeh et al.[10] focused on Syrian refugee camps in Jordan and Lebanon, examining the social networks and support systems among residents. The research revealed the importance of community engagement, social cohesion, and the role of informal networks in enhancing the well-being of camp inhabitants. These findings underscore the significance of fostering community-driven initiatives and participatory approaches in camp management.

Moreover, access to livelihood opportunities is crucial for enhancing the livability of refugee camps, as it allows individuals to support themselves and regain a sense of agency. Dalal[11] explored the economic activities and entrepreneurial endeavors within Al-Za'atari Refugee Camp in Jordan, highlighting the resilience and resourcefulness of refugees in creating income-generating activities, contributing not only to their own well-being but also to the local economy. It emphasized the importance of economic empowerment and facilitating market integration for refugees within camp settings.

The involvement of camp residents in the planning and design processes can also significantly contribute to the livability of refugee camps. Albadra et al.[12] explored participatory approaches in the planning and management of camps, showcasing the positive outcomes of involving refugees in decision-making processes and leading to improved spatial organization, increased safety, and the development of community-oriented spaces.

The Role of Refugees in Shaping Their Own Spaces

Empowering displaced individuals to actively participate in decision-making processes and contribute to the development of their living environments has been recognized as crucial for fostering a sense of ownership, dignity, and resilience. By involving refugees in decision-making processes, their perspectives, needs, and aspirations can be better understood and incorporated into the physical and social dimensions of the camp environment.[13]

Furthermore, refugees may initiate community-led initiatives and self-organize to address their needs within camps. These initiatives can range from establishing schools and health clinics to setting up marketplaces and cultural centers. Social networks and informal governance structures are vital in refugee communities and contribute to shaping their spaces. These networks often develop organically and provide support systems, foster trust, and facilitate the sharing of resources and information. Eggerman et al.[14] explored the role of social networks in Syrian refugee camps in Jordan and Lebanon, highlighting their significance in accessing livelihood opportunities, securing housing, and maintaining social cohesion. Recognizing and leveraging these existing networks can help create stronger community bonds and contribute to the resilience and development of refugee spaces.

It's important to consider the refugees' active involvement in advocacy and representation. By voicing their concerns, needs, and aspirations, refugees can influence policies, programs, and resource allocation. This emphasizes the importance of providing platforms and support for refugees to engage in advocacy efforts, enabling them to shape their own spaces and challenge the narratives that often marginalize displaced populations.

CASE STUDY: AL-BAQA'A REFUGEE CAMP IN JORDAN

Al-Baqa'a is one of the oldest and largest refugee camps in Jordan. It was established in 1968 to accommodate Palestinian refugees who were displaced due to Israeli occupation of the West Bank. Initially intended as a temporary solution, the camp has gradually evolved into a permanent settlement and is currently in a dilapidated condition. Over the years, the camp's population has grown significantly, becoming one of the largest refugee camps in Jordan.[15]

Located in a densely populated urban area near the capital city of Amman, Al-Baqa'a camp is home to over 100,000 refugees. Despite the challenging living conditions, Al-Baqa'a has developed a vibrant and resilient community over the years, with its own distinct culture, social dynamics, and economy. The camp has a range of small businesses, including food stalls, shops, and workshops, and many residents have developed a strong entrepreneurial spirit. Social networks and communal activities play a crucial role in fostering community cohesion and support systems within the camp.[16]

The camp has also developed its own economic activities and informal economies. Small businesses, such as shops, workshops, and services, have emerged within the camp, providing livelihood opportunities for the residents. These economic endeavors contribute not only to the well-being of individuals and their families but also to the local economy.[17]

Architectural and Urban Morphological Transition

Over time, Al-Baqa'a camp has undergone an architectural and urban morphological transition from a temporary to a more permanent settlement. Initially consisting of makeshift shelters and tents, the camp gradually witnessed the construction of more permanent structures using concrete and other materials. The architectural transformation reflects the long-term nature of the camp and the residents' need for durable and improved housing.[18]

The camp's urban morphological transition is characterized by the densification of built structures, the emergence of narrow alleys, and the expansion of the camp's boundaries stemming from the evolution of the shelter unit itself to accommodate the growing population and the changing needs of the community. The camp's layout has become more complex, with the integration of various services, such as schools, health clinics, and community centers.[19]

Livability of Al-Baqa'a Refugee Camp as a City

The concept of a livable city encompasses various social, economic, environmental, and physical aspects. Assessing whether Al-Baqa'a camp qualifies as a livable city requires examining these dimensions within its specific context while also considering its challenges and limitations.

The social dynamics within Al-Baqa'a camp contribute to its livability. The camp community has developed a strong sense of identity and solidarity, fostering social cohesion and support systems among residents.[20] However, overcrowding and limited privacy in the camp can pose challenges to the quality of life and social relationships among residents.

Regarding the economic aspect, Al-Baqa'a camp has developed its own economic activities and informal economies, which contribute to the livelihoods of its residents. Small businesses and services within the camp provide income opportunities and contribute to the local economy.[21] However, the economic opportunities within the camp may be limited compared to those available in urban areas,

which can impact the residents' long-term economic prospects as well as lead to internal migration of camp residents.

The environmental dimension of livability in Al-Baqa'a camp faces significant challenges. The camp's infrastructure and services, including access to clean water, sanitation, and waste management, can be considered inadequate.[22] These challenges impact the health and well-being of residents and hinder the camp's overall livability.

The physical aspect of livability in Al-Baqa'a camp has undergone a transition from temporary to more permanent structures since the camp's establishment. The architectural and urban morphological transformation reflects the long-term nature of the camp and the need for durable and better-quality housing.[23] The presence of UNRWA-managed schools, health clinics, and community centers within the camp demonstrates efforts to provide essential services to residents. However, the densification of built structures, as well as their low quality and limited space pose challenges to the physical livability of the camp.

CASE STUDY: AL-AZRAQ REFUGEE CAMP IN JORDAN

Al-Azraq is a more recent refugee camp, established in 2014 as a response to the increasing influx of Syrian refugees into Jordan. Its primary purpose was to address the immediate humanitarian needs of Syrian refugees and offer a safe and secure environment.[24]

Unlike Al-Baqa'a, Al-Azraq camp is located in a remote desert area, around 100 kilometers east of Amman. The camp was designed to be more sustainable and livable than traditional refugee camps, with durable housing units, solar power, and a centralized water and sewage system. The camp also features a marketplace, community center, and schools. Despite the challenges of living in a remote desert location, the refugees have developed their own sense of community and identity, and have established a range of small businesses and services, including cafes, grocery stores, and hair salons. The planning and design of Al-Azraq camp focused on providing essential infrastructure and services for the displaced population. The camp layout was organized into decentralized blocks called "villages", each containing prefabricated shelters, communal facilities, and service areas.[25]

Social and economic development within Al-Azraq camp have been a priority to enhance the well-being and self-reliance of its residents. Various organizations and humanitarian aid agencies have implemented programs to support education, vocational training, and livelihood opportunities.[26] Community centers and spaces have been established to foster social cohesion, provide psychosocial support, and facilitate recreational activities.[27] These efforts aim to create a conducive environment for the social and economic development of the camp's population.

In terms of livability, Al-Azraq camp presents some similarities and differences compared to Al-Baqa'a camp. Both camps face challenges in terms of infrastructure, services, and environmental conditions. Although Al-Azraq camp is a more recently established camp, improved planning and design considerations were not taken into account during its deployment, which could indicate its future of becoming similar to Al-Baqa'a camp in terms of physical deterioration, declined quality of life, and lack of resources.

PROPOSED FRAMEWORK FOR REFUGEE CAMPS AS LIVABLE CITIES

After considering the case studies of Al-Baqa'a and Al-Azraq refugee camps, the following framework for transitioning refugee camps from temporary shelters to permanent dwellings and sustainable, livable cities is proposed– as illustrated in Figure 1.

1. Long-term planning:

• Develop a comprehensive long-term plan for the refugee camp, considering factors such as population growth, infrastructure development, and service provision.

• Engage relevant stakeholders, including refugees, host communities, humanitarian organizations, and local authorities, in the planning process to ensure diverse perspectives are considered.

• Establish clear goals and objectives for the transition, incorporating elements of livability, sustainability, and community participation.

2. Community Engagement and Empowerment:

• Foster active participation of refugees in decision-making processes, ensuring their voices are heard and their preferences, customs, and needs are considered.

• Establish mechanisms for meaningful community engagement, such as participatory forums, community-led initiatives, and representative governance structures.

• Provide opportunities for skill-building, entrepreneurship, and capacity development within the refugee community, empowering them to take ownership of their living spaces.

3. Sustainable Infrastructure Development:

• Invest in the development of sustainable infrastructure that supports the long-term livability of the camp. This includes reliable water and sanitation systems, efficient energy sources, and resilient shelter structures.

• Collaborate with architectural and engineering experts to design infrastructure that considers the cultural and social needs of the community.

• Implement infrastructure projects that prioritize environmental sustainability, resource efficiency, and resilience to climate change.

4. Access to Basic Services:

• Ensure equitable access to essential services within the camp, including healthcare, education, clean water, sanitation, and electricity.

• Collaborate with relevant organizations and institutions to establish healthcare facilities, schools, vocational training centers, and community centers.

• Promote inclusivity and gender sensitivity in the provision of services, addressing the specific needs of women, children, elderly individuals, and people with disabilities.

5. Economic Opportunities:

• Facilitate economic opportunities within the camp, promoting self-reliance and economic independence for refugees.

• Establish vocational training programs, microfinance initiatives, and entrepreneurship support to enable refugees to generate income and contribute to the local economy.

• Encourage the establishment of small businesses, cooperatives, and social enterprises within the camp, fostering economic growth and employment opportunities.

6. Social Cohesion and Cultural Integration:

• Foster social cohesion and cultural integration within the camp by promoting inter-community dialogue and cultural exchange programs.

• Encourage the preservation and expression of cultural identities and traditions, recognizing the diversity within the refugee community.

- Facilitate interactions and collaborations between refugees and the host community to promote mutual understanding, trust, and peaceful coexistence.

7. Monitoring, Evaluation, and Adaptation:

- Establish a monitoring and evaluation framework to assess the progress and impact of the transition process.
- Regularly collect data and feedback from refugees, host communities, and relevant stakeholders to identify strengths, weaknesses, and areas for improvement.
- Adapt the transition approach based on the evolving needs, challenges, and opportunities within the camp, ensuring flexibility and responsiveness to changing circumstances.

8. Partnerships and Coordination:

- Foster collaboration and coordination among humanitarian organizations, governmental agencies, NGOs, and other relevant stakeholders involved in the transition process.
- Establish partnerships with local authorities and institutions to leverage their expertise, resources, and governance structures.
- Advocate for increased support from the international community to ensure adequate funding, technical assistance, and capacity building for the transition process.

Figure 1. Proposed Framework for Refugee Camps as Livable Cities. Illustrated by authors.

CONCLUSION

The global refugee crisis has necessitated the establishment of refugee camps as temporary solutions to provide essential needs to displaced populations. Yet this paper asserts that refugee camps possess the potential to develop into dynamic and adaptable urban ecosystems that foster livable communities. By examining case studies from Jordan's Al-Baqa'a and Al-Azraq refugee camps, it becomes evident that refugees play an instrumental role in shaping their living environments, taking ownership of their spaces, exercising autonomy over their spaces while creating resilient communities with distinctive cultures, economies, and social dynamics.

To assist the transition of refugee camps from temporary to permanent dwellings, this paper offers a framework that emphasizes long-term planning, community engagement, sustainable infrastructure development, access to basic services, economic opportunities, social cohesion and cultural integration, monitoring evaluation and adaptation as well as partnerships and coordination among stakeholders. By adopting this framework and taking a more long-term approach to refugee settlement, humanitarian responses can move away from offering temporary solutions and towards offering more humane and sustainable interventions.

Such a transition can help create more livable environments in refugee camps, creating an atmosphere of self-reliance and dignity among displaced populations. In turn, this could contribute to more inclusive and compassionate responses to the global refugee crisis as well as create resilient and thriving communities. To this end, cooperation from international humanitarian actors, host governments, NGOs, and local authorities is indispensable if refugees are to receive proper support for their wellbeing and livelihood.

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WHAT IS A FARMERS' MARKET?
EXPLORING THE MEANINGS AND ROLES OF A RESILIENT URBAN SPACE

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INTRODUCTION

The farmers' market is a quintessential traditional public space that has shown remarkable resilience over time. It is a vital urban institution that has played a pivotal role in shaping and driving urban development. Positioned at the heart of the city, it is an intrinsic part of the city's identity, serving as a public space for daily interactions, exchanges, and encounters. From a historical perspective, the farmers' market has always been a public urban space that has evolved, adapted, and gained new meanings in response to the changing needs of the city. In the postmodern era of sustainable urban development, the farmers' market is recognized as a key site for urban growth and development with immense potential for reinterpreting the farmers' market as a crucial element of the urban landscape. This paper is based on research that explores the significance of the interplay between tradition and innovation, old and new, as it illuminates the intricate interconnections between the social and spatial dimensions of the city. The research[1] conducted in Croatian cities aimed to gain deeper understanding of the meanings and roles ascribed to the farmers' market by participants, whihe also identifying their potential as a vital community asset.

ACCUMULATED TEMPORALITY AND SPATIALITY

The discussion on the meaning of public space and the public sphere has been a pervasive part of urban sociology since the days of the Chicago School of Sociology throughout the twentieth century, with seminal works by Lefebvre, Jacobs, Soja, Harvey, Low, and Madanipour, to name just a few.
Following Crawford's[2] redefinition of public space, where she emphasizes the everydayness of public spaces as the "connective tissue that binds daily lives together, amorphous and so persuasive that it is difficult even to perceive," as well as the temporality of public space that exists simultaneously in the past and in the future, we perceive public space such as farmers' markets through the accumulation of temporal and spatial diversities.
Another concept utilized in this research to further explore the notion of the everydayness of public space is Koch and Latham's[3] analytical concept of domestication, which expands our understanding of how places and relationships become familiar, ordinary, and mundane. Koch and Latham employ the ideas of inhabitation, materiality, and atmosphere to elucidate the processes of domestication.

Inhabitation emphasizes that public space is formed through the movement of bodies, rather than solely through the designation of space as public. In a similar way, they approach materiality not only as encompassing the physical elements such as materials, objects, technologies, and amenities that constitute and shape public space but also as relational points that have the potential to generate specific affordances for domestication. Lastly, Koch and Latham[4] introduce atmosphere "as a way of trying to attend to the prevailing moods, feelings, emotions, and meanings that collectively shape the experiences within a given site." The atmosphere can be comprehended as an overall context where people create connections to specific spaces and the as Böhme[5] pinpoints atmosphere is a commonplace for inhabitants, and it is very closely connected to daily lives of locals.

RESILIENCE, FLUX AND TRAPPED VITALITY

When we discuss farmers' markets, we are talking about vital urban institutions—playgrounds for observing the spatiality and sociality of cities.[6] Farmers' markets simultaneously adapt to changes and reshape the urban landscape. While there are various types of farmers' markets across Europe, they all share a common denominator: their response to change.[7]

One of the factors that contributed to the resilience of farmer's markets, is the culture of improvisations and adaptations, necessary for functional vending activity. Farmers' markets have an aura of a museum of everyday survival. Besides the original stands and equipment, one can often see different kinds of upgrades made from various materials often found on site. Some of the adaptations are more skillful than others, showing the capacity of vendors to adapt, fix or creatively intervene in their surroundings, with the aim to make their business run more smoothly. Plastic bags and price tags are often hanging from parasols, making them easily affordable when needed. Paper bags are being used as price tags, teasers, or simply to level the leaning stand. The vendors often employ their creative and improvisation skills to highlight their business identity, communicate price tags, or write teasers to attract their customers.[8]

Back in 1996, Sarah Buie[9] made an excellent observation that globalization is eroding the essence of marketplaces. As she states[10] "the market principle destroys the marketplace" as contemporary market principles cannot be fully realized in a marketplace. The traditional farmers' markets embody an "erotic" interdependence—a physical experience characterized by small-scale interactions, contact, possibilities, and sensory elements. Following that premise DeMuynck[11] raises a vital question on farmers' markets: redevelopment for whom? The revitalization often excludes marginalized and socially vulnerable groups. It is important to emphasize that contemporary farmers' markets find themselves caught between the notions of lived space and strategic tools for urban growth. Both notions exploit the ideal and utopian character of farmers' markets. Due to all the mentioned processes and influences, it seems logical to return to the perspective of the user, the city dweller who visits the market and who, together with the sellers, constantly creates the spirit and identity of that space through various activities.

AN EXAMPLE OF FARMER'S MARKETS RESEARCH IN THE CROATIAN CONTEXT

While farmers' markets are somewhat universal, they are also culturally specific.[12] Croatia traditionally exhibits a way of life intricately intertwined with street life, open spaces, public areas, and the traditional Mediterranean lifestyle. The existence of varying regional designations already signifies the diverse cultural influences and underscores the significance of farmers' market spaces. With that in mind, in the European context, farmers' markets are quintessential traditional public spaces that serve as examples of resilient spaces. The strategic positioning of farmers' markets within city centers or neighborhoods provides an opportunity for previously unused spaces during the afternoon and evening to acquire a new purpose during the afternoon and evening and open to a

different spectrum of visitors.[13] All these changes and attempts at revitalization leave behind an open question: what does farmers' market represent and mean to us? When we hear the expression farmers' market, what do we think of, what image do we associate with?

Briefly on Methodology

Employing a mixed methods approach, the research methodology incorporates diverse techniques based on both quantitative and qualitative methods. The integration of different types of data follows the principles of mixed-methods research, utilizing a convergent design to facilitate the comparison and combination of various datasets.[14]

The researchers aimed to elucidate first three associations that city dwellers form with the term "farmers' market." This approach is conceptually aligned with research that emphasizes understanding urban phenomena through the analysis of the meanings people attach to elements of the urban environment. Furthermore, it highlights the importance of various mental activities, such as seeing, listening, and smelling, in shaping how a place is perceived and experienced. [15]

It was hypothesized that employing an open-ended question format would encourage respondents to freely express their views of the farmers' market, providing a wide range of associations that reveal different dimensions of this public urban space.

The study involved a total of 679 participants, hailed from Croatian cities.

Results and Discussions

A comprehensive examination of farmers' markets revealed the identification of fourteen distinctive facets that characterize these market spaces. The facets were delineated based on the words employed by respondents to depict their perceptions. Notably, food-related associations, "above all, food," emerged as the most prevalent, with respondents frequently employing terms such as vegetables and fruit. This finding corroborates the pivotal role of food within farmers' markets, underscoring the notion that it encompasses more than mere sustenance. The essence of farmers' markets lies in the presence of natural products, imbued with authenticity and representing a distinct identity through their produce.

Following the prominence of food-related associations, "the quality of products" surfaced as a salient facet, with descriptors such as natural, seasonal, and fresh being the most strongly associated. The significance of local, homegrown, and traditional products also emerged as a substantial facet, underscoring the vital role played by these markets in preserving and promoting "local identities."

Beyond the pragmatic associations, the aspect of "atmosphere" held notable importance, as respondents conveyed overwhelmingly positive sentiments towards farmers' markets.

The facet pertaining to individuals present at the farmers' market, referred to as "characters", exhibited notable prominence, with the frequently employed term "kumica" capturing the essence of older female vendors within the regional context. The market is characterized by the captivating faces of women and older individuals.

An additional significant facet identified in the study is "sensory experiences," encompassing the comprehensive array of sensory associations evoked by farmers' markets, including vibrant colors, verdant surroundings, and aesthetic allure.

The facet of "trading" delineates associations related to the economic dimension of farmers' markets, reflecting the commercial interactions and transactions that occur within these market spaces. On the market stage, resellers and vendors compete fiercely for dominance. This dynamic imbues the trading arena with an overarching sense of intensity and spirited rivalry.

The "spatiality" facet accentuates the significance of market design and layout, encompassing elements such as stand arrangements and parasols that shape the flow of movement and established

routines within the farmers' market environment. The spatiality facet is succeeded by the "social dimension" of farmers' markets, capturing associations related to communication, customary rituals, and interpersonal connections, emphasizing the market's role as a space for social encounters. The "temporality" facet manifests as weekend mornings, identified as the prime visiting time for the majority of individuals frequenting farmers' markets. While not prevalent, a subset of respondents associated farmers' markets with negative aspects, including disorder, dishonest practices, and mistrust, revealing the less idealized aspects of farmers' markets or "underbelly" of farmers' market. Lastly, the final facet, "urbanities", denotes farmers' markets as living entities or integral components of the city, with associations evoking notions of the market as the heart, belly, soul, or spirit of the urban environment. The market enhances the vitality of the city, infusing it with a vibrant rhythm of life (pulse, heart, spirit...) and an invigorating energy (belly).
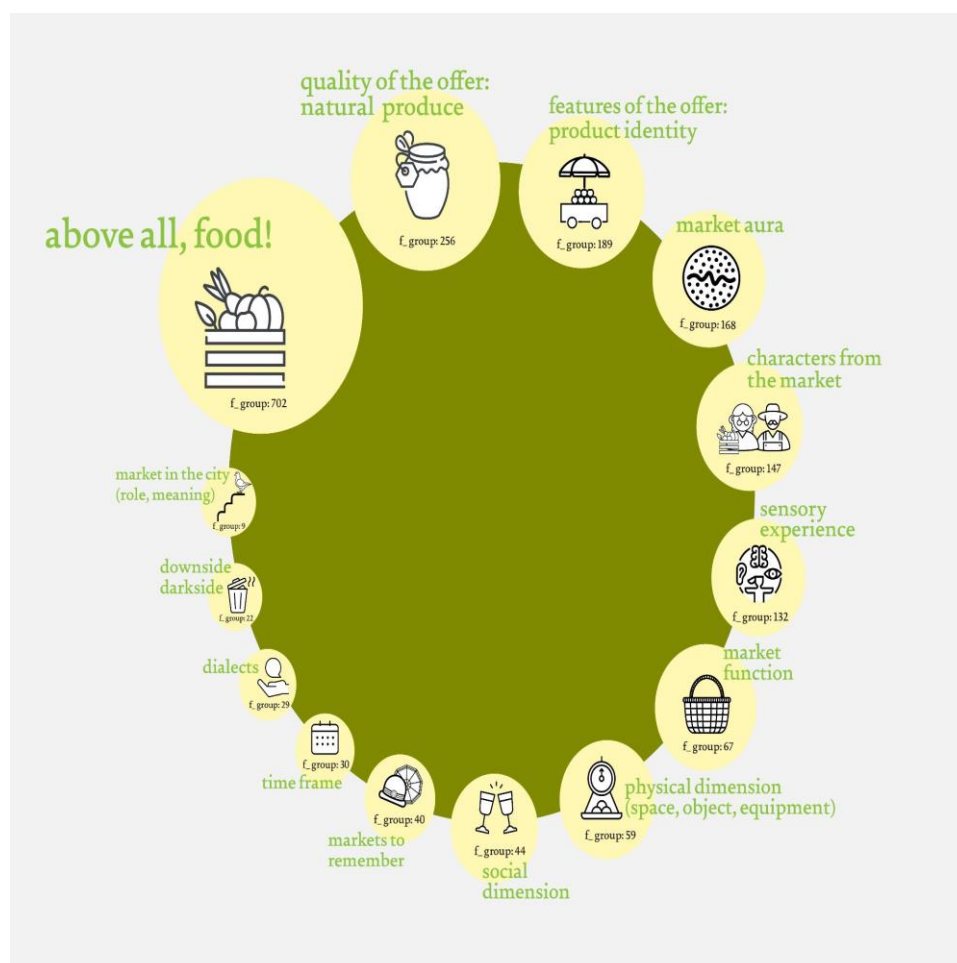
Figure 1. Visual interpretation of results

CONCLUSION: FACETS AND DICHOTOMIES OF FARMERS' MARKET

There are various facets and dichotomies of farmers' markets that we have identified in the literature and observed during this research. On one hand, we are faced with the global/local dichotomy, where the local and locality are of utmost importance for farmers' markets. However, on the other hand, the universal existence of farmers' markets, combined with contemporary connectivity, makes them globally relevant. Farmers' markets are also spaces that erase the boundaries in the rural - urban

dichotomy as it is a space where urban fabric is interwoven with rural produce, and it might be the last space in the city where that codependency is visible and vibrant.

Another aspect is found in the temporal dimension. Farmers' markets exist on an everyday scale, where visiting them becomes a routine, an ordinary non-event. But they also exist on a lifetime scale, where childhood memories of visiting farmers' markets with parents and grandparents intertwine with memories of the passing of time and the changes that occur in these markets. Moreover, the seamless transition between day and night dramatically alters the space of the farmers' market, much more than other public spaces in the city. The vibrant hustle and bustle, brimming with colorful displays, bustling crowds, and lively interactions that define the daytime experience give way to a hushed stillness and an eerie emptiness, completely transforming the environment into ghost space, often leaving the only traces of market through the marks on the ground that indicate the positions of stand.

Additionally, the farmers' markets are characterized by distinct and indelible sensory encounters that greatly contribute to their overall ambiance. However, among these various influences, it is the cyclical interchange of seasons that exerts the most profound impact on the sensory experience at farmers' markets. In the summertime, the air becomes infused with a delightful fusion of sweet fruit fragrances intertwined with the ripening scents that intensify under the sweltering heat. Conversely, winter brings gusts of wind carrying potent aromas of fermented cabbage, while the humidity amplifies the distinct smells of concrete and wood that envelop the farmers' market. Furthermore, the day's veils, as August Endell[16] calls fog, rain, dusk, dew, change the scenery of the place, creating different experiences on the farmers' market stage. Each of these facets and dichotomies, among many others, play a vital role in shaping the distinctive atmosphere of the market, offering an authentic and unparalleled experience that resonates deeply with local communities. As Rachel Black[17] aptly describes, these markets possess a carnivalesque nature that fosters an enduring resistance against the homogenization and bureaucratization of city life.

This research has confirmed that farmers' markets are complex and ambiguous public urban spaces. Characterized by a multitude of contradictory features, they elude a simplistic and standardized definition. Nevertheless, their significance lies primarily in the eyes of the beholders - the individuals who frequent them and ascribe personal meanings to these spaces. Such meanings exhibit diversity, mirroring the heterogeneous nature of the urban community itself.

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DIGITAL TWIN AND ARTIFICIAL INTELLIGENCE AS A PUBLIC PARTICIPATION TOOL FOR RECLAIMING THE POSTMINING BUILT ENVIRONMENT IN THE CITY OF MOST

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INTRODUCTION

The historical context of the City of Most

Coal mining operations in the Czech Republic have had an active impact on six districts. Specifically, brown coal mining occurs in eight opencast mines in the Most and Sokolov Basins. The possibility of expanding coal mining in the region has become a contentious issue because it involves conflicting perspectives, diverse interests, value judgments, ideologies, myths, and discourses.[1] Of particular significance is the Mining - Induced Displacement and Resettlement (MIDR) of the city of Most, which continues to have a lasting impact even today.

Mining in the city of Most, Czech Republic, has major social, economic, and environmental impacts. People in "Starý Most" were relocated to "Nový Most", disrupting social structures and networks, causing social dislocation and loss of community unity.[2] This often results in the loss of homes, traditional livelihoods, and cultural heritage, leading to social and psychological issues for the affected people.

The City of Most was famously destroyed by moving the Gothic Church of the Assumption of the Virgin Mary. A larger royal seat was then built and designed to accommodate 100,000 people. Currently, the city is home to approximately 65,000 people. The population is decreasing yearly, but many of its original inhabitants still live in the area, outside the city, in villages or on its outskirts. They travel to Most for work or school.[3]

Primarily, the wealthier and middle-class populations move to Most, as land and real estate prices are low. Most is "centrifugal" rather than "shrinking" due to its importance as the seat of administrative, sports, and cultural institutions.[4] Mining is a major contributor to local economies. Mining has created jobs and has spurred economic growth. However, when mining operations are closed or minerals run out, job losses, economic decline, and reduced local revenue can occur. Post-mining cities struggle to shift their economies away from mining and into other industries, which requires thoughtful planning and investment.[5]

Hněvín, Špičák, Zlatník, Bořeň - the Český Středohoří hills shape the landscape Most. Vrch Hněvín was a symbol of the old Most and is now beloved by locals. The wine is grown at the foot of the Most Basin, with a stunning view of the landscape from the top. It is close to the Ore Mountains, which are still associated with barren conifers and acid rain.[6] Mining activities can damage the environment, particularly in open-pit mining. This can cause land degradation, deforestation, soil erosion, and water

pollution. Mining and processing can release pollutants into the air, water, and soil, thereby endangering human health and the ecosystem. Rehabilitation and remediation of mining sites are essential for reducing environmental damage and restoring ecological balance.[7]

Overall, the social, economic, and environmental consequences of mining highlight the complex challenges faced by post-mining cities. Practical strategies and planning are required to address these consequences and ensure the long-term well-being and sustainable development of the affected community.[8]

Significance of Public Participation in reclaiming the built environment

Involving the public in decisions about reviving City of Most is essential. It acknowledges that residents and stakeholders have valuable insights and experience that can inform decisions. Their local knowledge can help to identify priorities, challenges, and opportunities. Engaging the public helps decision makers understand the community's needs and goals.[9] This collaborative approach promotes sustainable strategies, such as green infrastructure, energy-efficient design, and cultural heritage preservation, which ensure the City of Most's long-term viability and resilience. Involving stakeholders, such as residents, businesses, organizations, and cultural institutions, the project meets the population's diverse needs. Inclusivity builds ownership, empowerment, and lasting support.[10]

Public participation is essential to preserve cultural heritage and fostering social cohesion. Residents' perspectives inform decision makers in creating strategies that define the city's identity.[11] This leads to a more sustainable and vibrant built environment as residents help maintain and develop the city. Public participation also encourages dialogue and collaboration among stakeholders, building trust and cooperation for sustainable development.[12]

Digital technology can be used to reclaim the City of Most's built environment, offering advantages such as improved communication and engagement, visualization, data-driven decision-making, stakeholder inclusivity, cost-effectiveness, and long-term monitoring.[13] This study discusses digital technology as a public participatory tool. It proposes a framework for using digital tools to empower stakeholders, promote inclusivity, and contribute to the successful reclamation of the City of Most's built environment. Case studies, methodologies, and best practices are examined.

Artificial Intelligence and Digital Twin Technologies

Artificial Intelligence (AI) and Digital Twin (DT) technologies have emerged as powerful tools in urban planning and architecture, revolutionizing the visualization, analysis, and communication of development ideas.

AI is essential for urban planning and architecture because of its data analysis, prediction, and design optimization capabilities. Advanced algorithms and machine learning allow AI to process large amounts of data and detect patterns and trends to aid in decision-making.[14] AI can use demographic data, transportation patterns, and environmental factors to design sustainable and efficient urban spaces for the City of Most's reclamation. AI's data-driven approach also enables evidence-based decisions and improves the effectiveness of revitalization.[15]

Digital Twin technology creates virtual replicas of the physical environment, providing dynamic representations of the City of Most. Real-time data from sensors and GIS systems are integrated to simulate scenarios, allowing stakeholders to explore different development possibilities.[16] This immersive experience helps stakeholders understand the effects of different design choices, enabling them to provide informed feedback and participate actively in the reclamation process.[17] Digital Twin technology tests and refines design alternatives before physical implementation, thereby reducing the redevelopment risks and costs.[18]

AI and Digital Twin technologies can enhance public participation. They enable stakeholders to visualize and interact with development ideas and encourage collaboration.[19] Digital Twin and AI-driven data analysis provide residents, local communities, and decision-makers with a comprehensive understanding of the proposed interventions and their impacts.[20] This approach ensures that reclamation meets the community's needs and goals, leading to more successful and sustainable urban revitalization in Most.

ARTIFICIAL INTELLIGENCE AND ITS POTENTIAL FOR PUBLIC PARTICIPATION

Artificial Intelligence (AI) is based on core concepts, including machine learning, data analysis, and predictive modelling, which empower AI systems to learn from data, identify patterns, and make informed predictions. In the context of urban planning and architecture, AI's capabilities offer transformative possibilities for public participation.[21]

Machine learning enables algorithms to learn from data and to improve over time. AI systems can analyze large and complex datasets related to urban areas, such as demographic information, infrastructure data, and environmental metrics. AI can discover patterns and trends in these data, helping decisions in the City of Most's reclamation.[22]

Data analysis: A key AI capability for urban planning and public engagement. AI-driven data analysis can process large amounts of heterogeneous data, extract useful information, and generate actionable knowledge. In Most City, data analysis can be used to evaluate the building energy efficiency, detect pollution hotspots, and understand the distribution of public amenities. This data-driven approach allows stakeholders to make informed decisions and tailor the revitalization process to the community's needs and preferences.[23]

Predictive modelling: A vital aspect of AI that helps stakeholders anticipate the outcomes of different scenarios. By utilizing historical data and stakeholder inputs, AI can simulate the effects of design choices in Most City. It can assess the impact of zoning rules on housing affordability, evaluate the environmental effects of urban growth, and forecast population growth.[24] This insight promotes evidence-based decisions and public involvement in shaping the future of a city.[25]

Urban simulation: An AI application allows stakeholders to interact with a city's virtual model. This allows for real-time feedback and design experimentation, fostering public participation. Stakeholders can observe the effects of the proposed changes on a city's landscape, social dynamics, and economy, thus supporting informed and inclusive decisions.[26]

AI is essential for energy efficiency analysis of sustainable development. AI systems can analyze energy use, suggest energy-saving measures, and forecast energy requirements.[27] Involving stakeholders in energy efficiency initiatives raises awareness and collective responsibility for Most's ecological footprint, aiding a more sustainable reclamation process. AI is also used in urban planning, such as transportation optimization. AI algorithms can analyze traffic data, optimize traffic flow, and suggest public transportation routes. Involving residents in decision making allows transportation solutions to meet the community's mobility needs, reduce commuting times, and improve accessibility.[28]

DIGITAL TWIN TECHNOLOGY AND ITS POTENTIAL FOR PUBLIC PARTICIPATION

Digital Twin technology is transforming urban planning and architecture, especially in the City of Most. A Digital Twin is a virtual copy of the physical environment, including buildings, infrastructure, and the urban landscape. Data integration and simulation capabilities allow stakeholders to view, analyze, and interact with development ideas dynamically and engagingly. It is a digital reflection of the physical world, displaying real-time data and changes in the city. This virtual representation allows stakeholders to monitor progress, track performance, and assess the effects of

interventions.[29] The real-time view of the city increases transparency and accuracy of public participation, giving residents and decision-makers up-to-date information to contribute to revitalization.[30]

Scenario testing is a DT feature that allows stakeholders to simulate various development scenarios and visualize their effects.[31] This helps stakeholders make informed decisions, such as how land use planning changes traffic flow, green spaces, and community services. It also enables stakeholders to select the most desirable and sustainable development paths.[32]

Digital Twins also promote public participation through immersive visualization. Stakeholders can explore virtual city replicas and understand potential improvements and issues. This interactive experience facilitates the comprehension of urban planning concepts, thereby allowing residents and communities to comprehend design choices. Digital Twin technology immerses stakeholders, encourages active engagement, and enables them to contribute their ideas and preferences to a successful reclamation process.[33]

Digital Twin technology integrates multiple data sources into one platform, allowing stakeholders to consider environmental, infrastructure, social, and economic factors. This comprehensive view ensures that public participation is evidence-based, and decisions are informed by a deep understanding of Most's complexities and potentials.[34]

CASE STUDIES USING AI AND DIGITAL TWIN FOR PUBLIC PARTICIPATION

Herrenberg, a German town, uses a Digital Twin, which is a virtual model of the city, to tackle environmental and traffic problems. The Digital Twin is part of the Integrated Mobility Plan (IMEP 2030), created with public input to improve collaborative planning. Digital Twin technologies are helpful in Herrenberg for simplifying complex urban planning data and involving the public, particularly in hard-to-reach groups. Collaborative Augmented Virtual Environments (CAVEs) and mobile VR setups enable multiple participants to plan simultaneously, thereby reducing real-world risks and costs. Surveys of diverse participants have assessed user experiences and the effectiveness of VR presentations in informing future iterations.[35]

A Zurich case study proposes Minecraft, a sandbox game, as a tool for public engagement in urban planning using Digital Twin and gaming concepts. Minecraft fosters creativity, problem-solving, and teamwork, which are vital for participatory urban planning. The Geocraft project exemplifies this, using Minecraft and geospatial data to model future smart cities and facilitate public involvement in planning. This study highlights the emotional design of serious games, including their appearance, operations, and outcomes. These elements boost user engagement and social interaction, which are crucial for successful public participation.[36]

Seoul, South Korea's capital, provides a real-world case study on the use of DT in public participation. Digital Twin technology simulates urban scenarios, allowing citizens to observe policy impacts. Citizens are involved in surveys and real-time reporting of issues. Civic services span from individual buildings to the entire city. This collaborative approach, involving citizens and the public sector, increases transparency, equity, and fairness in decision making. Digital twin technology can move from a top-down expert-driven model to a more participatory one in urban planning. This increases efficiency and public involvement.[37]

Several case studies have shown the use of AI for public participation in the context of urban development. For example, CitySwipe is a mobile app developed by the MIT Senseable City Lab that uses AI algorithms to collect public opinion on urban development projects. Users are presented with images of potential urban designs and can swipe right or left to indicate their preferences. AI aggregates data, providing urban planners and decision-makers with valuable insights into citizen preferences.[38]

Another example of an AI tool used for public participation in the context of urban development is UrbanSim, an AI-driven simulation platform that helps city planners and policymakers visualize and analyze different urban development scenarios. It considers various factors such as land use, transportation, and economic activity to help make informed decisions. Additionally, the platform incorporates public feedback and preferences to ensure that the planning process considers the citizens' perspectives.[39]

The case of Amsterdam City, using AI is also worth mentioning, as Amsterdam has been utilizing AI to gather input from citizens for various urban development projects.[40] The municipality developed an AI-powered chatbot that engages with citizens, answers questions, and provides feedback on issues such as city planning, housing, public space quality, and transportation. The insights gathered from chatbot interactions can help shape urban policies that better reflect citizens' needs and preferences.[41]

PROPOSED FRAMEWORK FOR UTILIZING AI AND DIGITAL TWIN AS PUBLIC PARTICIPATION TOOLS

Based on the observation of case studies and methodologies, the following framework for utilizing AI and Digital Twin as public participation tools for reclaiming the built environment of the resettled City of Most is proposed – as illustrated in Figure 1.
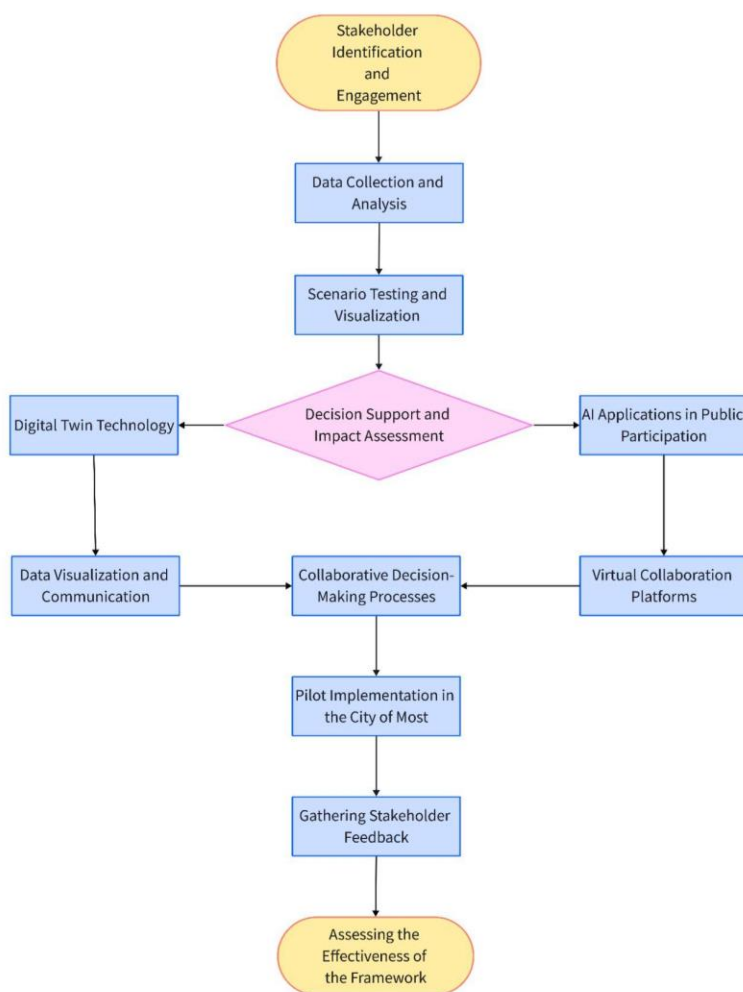

Figure 1. Framework showcasing the integration of AI and Digital Twin technologies in the various stages of public participation. Illustrated by authors.

Importance of Public Participation in the Context of the City of Most

- Recognizing Stakeholders' Perspectives and Local Knowledge
- Fostering Inclusivity and Empowerment
- Addressing Social and Environmental Equity
- Building Trust and Transparency in Decision-making
- Preserving Cultural Heritage and Identity

Reclamation involves the public's recognition of the unique perspectives and knowledge of residents, businesses, and cultural institutions. Inclusivity engages diverse groups and amplifies voices, thereby creating a sense of ownership and empowerment. This leads to stronger social cohesion and support for revitalization, fostering relevant and sustainable development. Social and environmental equity must be considered, and stakeholder inputs should prioritize vulnerable communities. Transparency builds public trust and preserves cultural heritage and identity honors Most's history, creating a sense of place and belonging.

Development of the Framework: Key Components and Considerations

- Stakeholder Identification and Engagement
- Data Collection and Analysis
- Scenario Testing and Visualization
- Decision Support and Impact Assessment

AI and Digital Twin are used as public participation tools in the reclamation of the City of Most. Stakeholder identification and engagement is the first step involving residents, local organizations, authorities, and experts. This framework offers effective channels for ongoing engagement throughout the process. Data collection and analysis are essential for AI-driven methods to process and interpret data and to provide insights for development. Digital Twin technology creates virtual replicas of cities, allowing stakeholders to visualize scenarios and impacts. AI predictive modelling forecasts outcomes, helps stakeholders evaluate scenarios and makes evidence-based decisions.

Integration of AI and Digital Twin Technologies into the Framework

AI Applications in Public Participation: AI is applied to analyze and process vast amounts of data, ensuring that stakeholders have access to comprehensive insights. Machine learning assists in data analysis, whereas predictive modelling aids in scenario evaluation and impact assessment. Natural language processing enables effective feedback processing.

Digital Twin Technology and its Role in Public Participation: Digital Twin technology creates dynamic virtual replicas of the City of Most, offering real-time monitoring and integration of data. Stakeholders can engage in immersive visualization, enhancing their understanding of development ideas and potential outcomes.

Enhancing Communication and Collaboration Among Stakeholders

- Virtual Collaboration Platforms
- Data Visualization and Communication
- Collaborative Decision-Making Processes

The framework uses virtual meetings, workshops, and online tools to facilitate communication and collaboration among stakeholders, regardless of location. Interactive dashboards and visuals make complex information understandable, aiding in communication. Participatory approaches, such as group discussions and consensus-building exercises, enable stakeholders to shape the revitalization process, build consensus, and support decisions.

Framework Implementation and Evaluation

• Pilot Implementation in the City of Most

• Gathering Stakeholder Feedback

• Assessing the Effectiveness of the Framework

The framework is tested in the City of Most, using public participation, AI, and Digital Twin. Stakeholder feedback is essential for evaluating the effectiveness and impact of a framework. Input from residents, communities, and decision-makers helps identify areas for improvement. The framework's performance is measured based on its ability to increase public participation, promote inclusivity, and enable data-driven decisions. Pilot outcomes and lessons are useful for future reclamation projects, aiding successful urban revitalization.

CONCLUSION

This paper proposes a framework to use AI and Digital Twin technologies to involve the public in the redevelopment of Most, Czech Republic. The framework emphasizes stakeholder engagement, inclusivity, and data-driven decisions to address a city's displacement. It acknowledges stakeholders' perspectives and local knowledge, empowers residents, and ensures that their needs and aspirations are prioritized in the revitalization process. AI and Digital Twin technologies have improved public participation. AI analyzes data and predicts outcomes, whereas Digital Twin technology creates a virtual platform for visualizing and testing scenarios. These experiences foster collaboration and communication, leading to informed and inclusive decision-making. AI and Digital Twin technologies can help revitalize the City of Most considerable. This framework ensures sustainable and equitable outcomes, preserves cultural heritage, and creates a strong sense of a place. These elements are integrated into development plans.

While the proposed framework holds great promise, it is important to acknowledge that its full potential is yet to be tested in the context of the City of Most. As a future direction, the implementation of the framework in the city will provide valuable insights and lessons for further development and improvement. Additionally, the lessons learned from this pilot project can be applied to other resettled cities that face similar challenges, contributing to the advancement of public participation strategies in urban planning and architecture. In conclusion, AI and Digital Twin technologies as public participation tools can help reclaim the built environment. This framework can create a more sustainable and resilient City of Most promoting inclusivity, empowering communities, and enabling data-driven decisions.

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THIS IS LONDON: ANALYSING THE VISUAL TECHNIQUES OF THE 'PRETTY CITY'

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INTRODUCTION

The paper examines the visual techniques of the localities of the top levels of social class that invite a touristic gaze and have been adopted and utilised by tourism promotional media to construct a visual language of London. Visual and textual analysis of Condé Nast Traveller's 2017 feature on London, published in the magazine's 20th anniversary issue will be the focus of this discussion.

Placed within the context of social change in London, this paper brings attention to the urban social elite amidst growing inequality in the city. Imperial College London's study entitled, *Changes in Life expectancy and House Prices in London from 2002 to 2019*, investigates "how much life expectancy has changed in relation to the combination of house prices in 2002 and their change from 2002 to 2019".[1] In their research, they "calculated the correlation between change in house price and change in sociodemographic characteristics …".[2] These findings can be drawn upon to consider the nature of the socio-spatial changes occurring within London; as noted by Cunningham and Savage's[3] analysis of the movement of the wealthy into central London locations, alongside Lees and White's[4] work on the evictions and demolition of council housing estates in identified gentrifying areas. Such research allows for a critique of pronouncements of the death of class that were prevalent in the 1990s, and the significance of class analysis in understanding contemporary inequality in London.

This paper draws on the renewed interest in the study of the rich amidst the restoration of wealth upwards,[5] that aligns with the implementation of neoliberal economic policies and principles in the last 40 years.[6] This is part of a broader study in which I examine visual discourses that make familiar and make audiences comfortable with the visual language of gentrification that celebrates the presence of an urban elite.

In her essay, ' Up the Anthropologist: Perspectives Gained from Studying Up', Laura Nader argued, that to study the rich is to gain an understanding of "the processes of power".[7] However, elites and the wealthy have not traditionally encouraged "critical investigation",[8] yet despite this tendency, I consider the way in which it is possible to gain insight into the way elite social groups make interventions into new environments, such as through their taste choices. I consider the way in which these public facing aesthetics of taste are expressions of power that command attention and are reified and celebrated in tourism promotional media.

This discussion allows for analysis of the way in which visual and material practices mark out the spaces of the wealthy, creating boundaries and distinctive visual grammar of their neighbourhoods; the facades of their residences and the prettified spaces and places of leisure. Thus, tying in with the

shaping of London as an expression of neoliberal capitalism, that is conveyed through images that invite a tourist gaze.

Condé Nast Traveller's 20th anniversary issue, featured a seven-page account of the ways in which London was changing. The feature's emphasis on select visual aesthetics, produces a specific meaning of a local London, rather than a global one. This is achieved by a visual grammar of neighbourhood, created by a unified style of architectural design and interior design as cultural productions that communicate gentrification and visually represent London as a 'pretty', suburbanized space.

The nostalgia aesthetic focuses very much on the local; which consists of a mix of recognisable preoccupations with middle-class fetishisation of Victoriana and "an appreciation of old things",[9] such as mid-century class-room furniture, enamelware . This is a London looking in on itself, and despite the promotion of fine dining in Michelin starred restaurants and boutique hotels in the Condé Nast article, there is little to suggest or indicate openness or inclusivity in these representations of the city.

The geographer, Brenda Parker argues that the "processes of neoliberalization have been deeply tied to and dependent upon a number of related discourses".[10] I am concerned with the other discourses that operate in tandem with neoliberalism. Neoliberalism is very much buoyed by other discourses of gentrification and tourism.

IMAGE 1: PRINTERS AND STATIONERS

The opening pages of the feature is a social street scene, which draws attention to idea of a local neighbourhood as a liveable and welcoming space of new urbanism. Absent are the references to the global investment and banking wealth in the form of the recognisable London skyline; the Shard, the Gherkin, or the Walkie-Talkie. Instead, the images bring together a mix of themes and ideas (which I will come to later in the paper), but here, the appropriation of the working spaces of the working class used to facilitate this colonisation of space is evident in the stock brick of the building, the cobbled street and the retained shop frontage. The *Printers and Stationers*, now a wine shop and bar, retains evidence of working class toiling, but now the stock brick building is used to create an aesthetic of heritage, with the former shop's signage in bold black typography is still in place. This is the public face of the business, aligning the past with the present, featuring highly in ideas related to expressing prosperity, community and aesthetics that feature in the visual appeals to attract tourists.

There is a crudeness about the fact that it is possible to capture working class spaces and make them liveable for "professional [and] urban" elites[11], in what Lees and White describe, "London as a hyper-gentrifying city with the highest land values in the UK (and some of the highest internationally".[12] Yet, there are no signs of this here. The idealised nostalgia inspired representations of neighbourhood that retain the architectural structures of those displaced provide a backdrop for liveability. Here, relaxed localness is inscribed in the people chatting, sitting on the side of the road, perhaps to convey after work drinks. The closed sign can just be seen behind the man standing idly and looking down towards the pavement. Yes, it is closed, to the workers who once occupied those spaces.

The appearance of the Black person in the opening pages of the feature perhaps relates to the idea of the feasibility of a bohemian space that can comfortably sit side by side with the affluent. In the appearance of the two men at the left of the image. The man wearing the white trilby hat stands, engaged in conversation with a man wearing what appears to be harem pants. Conveying in the image a quirky, friendly neighbourhood.

IMAGES 2: QUALITY OF LIFE IN LOCAL LONDON SETTINGS

In the course of the analysis, I asked, *What kinds of engagement are the images encouraging?* In the second image selected for analysis, notions of the quality of life in local London settings is evoked, along with one of the key ideas used to frame the visual language of the feature, is the use of memory

to align with the present. The visual references of the present are twinned with nostalgia for the recent past of the 1990s. The author reminisces that "It was 1997: none of us earned much, but in those days you could buy your friends rounds of drinks without worrying about the price of a gin and tonic".[13]

It gives the impression, perhaps as reminiscing is apt at doing, of conveying that life was much more simple back then.

In this selection of images, the potential visitor can imagine themselves living this London life. There is an assemblage of images. The first is a street scene, in which a young woman is pictured blowing away petals from large sunflowers. Perhaps she has recently visited the Columbia Road Flower Market? A long-view image of the redeveloped Regents Canal is juxtaposed with what appears to be artisan cheese, displayed on a wooden counter-top at Maltby Street Market. In the final image, two men are seated in what we are informed as being the *Cat and Mutton* pub near Broadway Market. The collection of images suggest that you should visit a flower market, or take a walk along Regent's Canal or visit Maltby Market for cheese, or go for a drink and a meal at the Cat and Mutton pub, near Broadway Market. In effect, live this life as a local would.

IMAGES 3: GENTRIFYING CULTURE TO CONSUME

The emphasis is on elevating places once marginal and considered unsafe. So now as Godwin describes, "the centre of gravity has moved east and south: Dalston, Shoreditch, Peckham and Brixton are all places I'd send a first-time visitor before say, Notting Hill".[14] Yet what he does not say is that what links all of these areas of London, is the arrival of wealthy populations, and a process that resembles colonisation, as those at the top of the professional and urban hierarchy are more likely to be white. Cunningham and Savage comment that there has been a "lack of attention towards the top levels of the social class structure",[15] although it is possible to observe the influence of the tastes of this group, as Rowland Atkinson[16] notes in their demands for service; here, it can be seen that there is a call to celebrate their aesthetic tastes too and demands for attention to be paid to the range of gentrifying culture to consume.

In the next set of images selected for analysis, there is an image of a mint green, classic Morris Minor convertible, parked on a cobbled street, described as "a gentrified street in Shoreditch",[17] in addition to curated plates of restaurant food, juxtaposed with a nostalgic "appreciation of [the] old"[18] in the form of Falcon enamelware plates, stonewashed, bone-handled cutlery, and Picardie drinking glasses, which are the chosen aesthetic of *Brixton Cornercopia*. Crafted identities of independent coffee shops, boutique hotels, and pop-up restaurants, specialist goods shops all feature in this portrayal of London, such as *Undercover*, the umbrella shop in Spitalfields, East London. They can all happily co-exist in this new formulation of London that does not speak a global language.

IMAGES 4: CRAFTING NOSTALGIA AND GENTRIFICATION'S COLONIAL ELEMENTS

The gentrifying aesthetic is an Anglo one which as previously commented, celebrates the *old*, incorporates the new, and is keen to retain colonial visual elements. Designer paint colours are used to modernise old buildings, as in the case of Ganton Street in Soho which has been painted in what appears to be *Farrow and Ball's Cook's Blue*.[19] A similar treatment has been applied to the much photographed townhouse in Warren Mews, Camden. The Georgian paint colour used is perhaps *Farrow and Ball's Downpipe Grey*,[20] prettified with a strategically placed prop of a bright pink peddle bike, painted in what resembles the traditional English paint company's *Rangwali*.[21]

In this neat and tidy formulation, London appears novel with its visual language of convivial nostalgia. It commands attention with its "seductive" and attempts to be "universal garb".[22] One example of this is the photograph of a room in Hogarth's house. The 18th century artist who famously depicted the lives of Londoners; elites, and the working classes and included the presence of Black

Londoners in his works. However, the practice of denying or minimizing the Black presence seems to be a requirement in this domesticization of imperial histories. It is as the historian David Olusoga[23] commented in his keynote for the Royal Geographical Society's annual conference, that no other topic arouses the same hostility as imperialism does in audience responses to the television programmes he has made for the BBC and Channel 4.

It seems that key to communicating this urban renewal is the forgetting or eradicating what Owen Hatherley considers as "the syncretic cultures that developed [in London] … from the 1950s onwards"[24] (Hatherley 2017, 200). There is no reference to the cultural or racial diversity of London except for the claim at the end of the article, Godwin claims that London possesses a "welcoming multicultural identity".[25]

It seems that it is possible to 'forget' the migrant populations who nurtured London. They do not fit with the neat and tidy narrative celebration of a pretty and whitened London.

CONCLUSION

Drawing on Paul Gilroy's analysis of postcolonial melancholia in England, it is evident that the "imperial and colonial past continues to shape"[26] the visual discourses of gentrification. Cloaking itself in myths of liveability, the images of a changed London in the Condé Nast feature aspire to be local, yet any obvious evidence of the extreme wealth that has flooded London in the past two decades is largely absent.

NOTES

[1] James E. Bennett, et al., "Changes in life expectancy and house prices in London from 2002 to 2019: hyper-resolution spatiotemporal analysis of death registration and real estate data" - *The Lancet* Regional Health – Europe. Volume 27, 100580, accessed August 6, 2023.

[2] Bennett et al. 2023.

[3] Niall Cunningham and Mike Savage, "An intensifying and elite city", *City*, 21:1, (2017) 25-46.

[4] Loretta Lees and Hannah White, "The social cleansing of London council estates: everyday experiences of 'accumulative dispossession'", *Housing Studies*, 35:10, (2020): 1701-1722.

[5] Shamus Khan, "The Sociology of Elites", *Annual Review of Sociology*, 38: (2012): 361-77.

[6] Andrew Sayer, *Why We Can't Afford the Rich*, Bristol: Policy Press, 2016.

[7] Laura Nader, "Up the Anthropologist: Perspectives Gained from Studying Up", *ERIC*, *Institute of Education Sciences*, (1972), 1.

[8] Huw Beynon, "Regulating Research: Politics and Decision Making in Industrial Organizations", in *Doing Research in Organizations*, ed. Alan Bryman, London: Routledge, 1988, quoted in Raymond M. Lee, *Doing Research on Sensitive Topics*, London: Sage, 1993, 8.

[9] Wendy Shaw, "Heritage and gentrification: Remembering 'The Good Old Days' postcolonial Sydney", in *Gentrifications in a Global Context: The New Urban Colonialism*, eds. Rowland Atkinson and Gary Bridge, London: Routledge, 2005, 67.

[10] Brenda Parker, *Sex and the City. Gendering Neoliberalism*, PhD diss., University of Wisconsin, 2008, 152.

[11] Rowland Atkinson and Gary Bridge, eds. *Gentrification in a Global Context: The New Urban Colonialism*, Abingdon: Routledge, 2005, 2.

[12] Lees and White, "The social cleansing of London estates, 1703.

[13] Richard Godwin, "It's a London Thing. Our capital has always had the bright lights, always been a big city. But it changed more in the past two decades than at any time in the previous century. Here we count the ways", *Condé Nast Traveller*: *The 20th Anniversary Issue*, October 2017, 178.

[14] Goodwin, "It's a London Thing", 176.

[15] Cunningham and Savage, "An intensifying and elite city", 26.

[16] Atkinson, *Alpha City*, 2020.

[17] Condé Nast Traveller, "It's a London Thing. Our capital has always had the bright lights, always been a big city. But it changed more in the past two decades than at any time in the previous century. Here we count the ways", in Condé Nast Traveller, "The 20th Anniversary Issue", October 2017, 178.

[18] Shaw, "Heritage and gentrification", 67.

[19] Farrow and Ball Paint and Paper, *Colour Card*, 2022.

[20] Farrow and Ball, 2022.

[21] Farrow and Ball, 2022.

[22] Paul Gilroy, *After Empire Melancholia or Convivial Culture?*, Abingdon: Routledge, 2004, 4.

[23] David Olusoga, Keynote lecture. *Royal Geographical Society* Annual Conference, 2021.

[24] Owen Hatherley, *The Ministry of Nostalgia*, London: Verso, 2017, 200.

[25] Goodwin, "It's a London Thing", 180.

[26] Gilroy, *After Empire*, 2.

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LANDSCAPE IN MOTION: DESIGN PRINCIPLES FOR LIVABLE CITIES

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INTRODUCTION

This paper outlines design concepts that have emerged from the project Landscape in Motion,[1] co-authored with site dance choreographer Melanie Kloetzel. The project involves creative research in the fields of landscape architecture and performing arts, specifically site dance, and acts as an interdisciplinary inquiry into the relationship between the human scale and urban infrastructures. Within the project, through movement, the body acts as a perceptual tool to explore the way we interact with and live in the city environment – "life in the landscape"[2] – and to reveal the potential environmental and social value of urban infrastructures.

These neighborhoods sit at the confluence of the Bow and Elbow Rivers, a place of natural and cultural significance. Traditionally a vital navigation intersection and encampment site for Indigenous people following bison migration paths,[3] the rivers' confluence was also the area where the colonial occupation began in 1873. The transcontinental Canadian Pacific Railway (CPR) reached the place in 1883 and was a major driver of the settlers' urbanization process on this land. Nowadays, Ramsay and Inglewood comprise a dense fabric of residential and commercial buildings, industrial heritage sites, brownfields, and wildlife preserves. A new Light Rail Transit (LRT) line currently under construction, including a station at the intersection between the two neighborhoods and a major road corridor (11 Street SE), will soon profoundly transform the Ramsay/Inglewood communities. From in-depth landscape analysis and multiple journeys through the neighborhoods, specific places surrounding the intersection mentioned above emerged as promising for the Landscape in Motion research: Jefferies Park – a popular public green space within the Ramsay community offering a panoramic view of the railway corridor and yards, Inglewood and, on the horizon, the prairie landscape; industrial heritage areas east of 11 Street SE – featuring vacant lands and a series of heritage buildings that now house the Ramsay Design Centre, coffee shops, artist studios, small businesses, and work-share areas; and various interconnected spaces around 11 Street / 17 Avenue SE intersection streetscape, which acts as an interface between the almost "secret" residential fabric of Ramsay on the west side and the vastness of major urban infrastructures and industrial areas on the east side.

METHODOLOGY

Our developing methodology employs a framing device called "critical experiential archaeology."[4] This refers to the temporal and material "excavation" that happens in the project and the notion of landscape as a palimpsest. Using this framing device, we examined the landscape context using

spatial data and experiential activities. The collection of information from publications, historic photographs and spatial data sources and the related interpretive mapping work were complemented by on-site investigation. Information concerning the historical evolution of the sites and the main landscape systems was synthesized through graphic representation, while site-specific dance's physical and phenomenological research methods were used in the field.

An integral part of our methodological objectives was to explore ways to annotate the site-specific landscape components and choreographic input that emerged from our investigation as "scores"[5] for landscape meta-design and choreographic creation. Through a multi-media and cross-referential system of representation, which we called "score-maps," we intended to show and share information about landscape systems, the "web of experiences"[6] of site-based inhabitants, and the choreographic actions inspired by this "web." Focusing on terminology and ideas that are significant for both landscape architecture and site dance, we initially identified categories of site investigation that are profoundly similar in the two disciplines – such as History, later re-conceptualized as Timeline of Gesture (Era), Environmental Systems/Environmental Dialogues, Culture and Society/Community, redefined as Gesture of Timeline (Age) – and More-Than-Human[7] concepts around plant and animal ecology and architectural materiality. Given the cross-scalar dimension of our interdisciplinary work, we faced the challenge of developing a representation system that could honor both the landscape/site scale and the human bodily scale and provide visualization of the interrelationship between them. We landed on crafting a series of diagrammatic plans and perspective views that synthesize the site's structure and most relevant landscape features alongside annotations that show the placement and quality of key choreographic actions, verbally described by an adjective-verb pairing. The individual gestures (actions and motion) at the micro-scale of the body were further represented through sequences of photographs (Figure 1). These multimedia and cross-referential materials can act as a "score" for site choreography (dance films) and landscape meta-design.

Figure 1. 17 Avenue SE streetscape. Examples of cross-referential perspective views and action photographs. Featured action: "Taut connecting"

DESIGN PRINCIPLES

At the time this article was written, the "score-mapping" work and the dance films were complete. The films offer a documentary-style representation of the choreographic actions and the sense of place that emerged in our research process.

Regarding a landscape design-oriented reflection on this interdisciplinary work, we found that fundamental aspects of the landscape architecture approach were amplified as if through a magnifying glass. These include (1) an appreciation of simplicity by design but also, conversely, by abstaining from intervening or building; (2) celebration of the vulnerability and power of the human body by creating accessible, comfortable and welcoming spaces; (3) respect for the environmental and socio-cultural values inherent in the place's ecology; and (4) the potential of the landscape's materiality in engaging tactility and other sensuous stimuli. Especially if synergistically applied, we believe these principles can relevantly contribute to our cities' livability.

Appreciation of simplicity

French landscape architect Bernard Lassus, in his essay "The Obligation of Invention" (1998), presented the idea of "minimal intervention"[8] and stated that "The fact that a place exists before one proposes to do something to it has repercussions on the nature of the intervention and poses, radically, the question of knowing whether or not one has to intervene."[9] A critical theoretical framework in landscape architecture is to calibrate the "weight" of the transformation by design to the level of sensitivity of the site/context, concerning multiple factors such as environmental/ecological sensitivity and socio-cultural and perceptual sensitivity.[10] However, this sensitive approach is not yet well-established in everyday practice. The dancers' interaction with the physical components of the site, as well as the evocative embodiment of past inhabitants of the communities and their stories, provide a sense of the richness of landscape elements (either tangible or intangible, natural or built) that by design can be preserved or re-interpreted in a new arrangement[11] to respect and communicate the uniqueness of the place. Because of the distracted way we often experience and consume space in the urban environment, we tend to disregard the meaning or potential of simple elements – such as a tree (Figures 7a and 10a), a slope (Figure 7b), or a building's features (Figures 3, 5, and 9b) – to create a space that is significant, through and beyond its function. A sensitive approach to the value of traces from the past, existing site conditions and the community's life would make the question of whether and how to intervene more prominent in the planning and design process.

Celebration of the vulnerability and power of the human body

An additional design intention that we emphasize is celebrating the vulnerability and power of the human body by creating accessible, comfortable, and welcoming spaces. Since the initial steps of conceptualization of this project, we aimed to investigate the relationship between the human scale and urban infrastructures and reflect on the impact that the scale of the latter, their hardscapes, their set-back buffer can have on generating barriers to movement, discomfort, and the perception of a hostile environment. In Ramsay and Inglewood, there is a perceivable tension between vastness and micro-environments, which we explored with curiosity and fascination regarding both experience and aesthetics of the urban fabric. A strong contrast between attractive visual connections due to topographical features and, on the other hand, the constraints derived by limited, punctuated physical accesses across the neighborhoods was also recognized as a peculiar characteristic of the site context.

Crossing through scales and seeking "solidarity"[12] (temporal and spatial linkages) between various landscape components is inherently part of landscape design. Nonetheless, one of the most pressing challenges we faced developing the "score-maps" annotation system was the communication of the human bodily scale (and of the body's motion on-site) within the representation of the landscape

context since the dialogue with the dance team and the choreography work made it apparent that the scale of investigation included something as small and fragile as parts of the body (feet, hands, shoulders, face…) and their gestures. What started as a representation issue then generated design-related questions, particularly in relation to the multiple scales landscape design should be able to handle holistically to make a space livable for all. In parallel, what in a place can be inviting or, conversely, what can prevent movement and flow was interesting to observe. From the dancers' interaction with the sites, both archetypal architectural spaces and landscape ecology spatial concepts stood out, and the research suggested key elements that landscape design should prioritize. Examples include the following ideas.

Threshold

Threshold, liminal[13] space, edge, and ecotone (in ecology, a zone of transition between two habitats)[14] emerged as critical concepts with high design potential regarding their literal and metaphorical meaning. Numerous of the dancers' "environmental dialogues" engaged with liminal spaces, such as the edge or fringe between building facades and road or railway infrastructures and (unresolved) transitions between walkable and vehicular corridors (Figure 2). These edges are recognized as (micro-)sites with their own critical role and meaning, not merely as passage spaces or marginal areas.[15] An active horizontal/vertical space dialectic and a certain "magnetism" between the architectural object and the surrounding open space (inside/outside relationships) are also implied by the threshold concept (Figure 3).

Figure 2. 11 Street SE railway underpass. "Intermittent limb placing"

Figure 3. Industrial heritage area. Perspective view of the surroundings of the Ramsay Design Center historic building with annotations on Environmental Dialogues actions

Stepping stones

Small-scale objects and *objects trouvés* may attract interest and constitute stepping stones for human movement, rest, and play. In landscape ecology, stepping stones can be defined as "a series of small habitat areas that can act as corridors for the movement of species;"[16] these "small patches that interrupt extensive stretches of matrix"[17] play an essential role in "fragmented landscapes."[18] Here, we refer to small-scale landscape components and urban *objects trouvés* that break down the vastness of the infrastructural landscape into punctuated human-scale spaces. These objects may be barriers or obstacles, but they can also function as "anchors" to find a place within an unprotected or undefined vast open space. By attracting attention and interest, they can stimulate a different way of moving more pleasantly through the space (Figure 4).

Figure 4. (a) "Interrupted sunning" near a railway road crossing; (b) "Careless flipping" at a jersey barrier in Jefferies Park's north area

Shelter

Architectural objects – but also natural elements that create a room or a ceiling – act as a shelter, playing a protective role, generating inhabiting conditions, and scaling the urban fabric to the human body scale. Examples of spaces we engaged with in our project include architectural archetypes such as the wall, the door, the staircase,[19] the corner,[20] the roof (made by a large tree's canopy with embracing branches), and the sheltered enclosure or "enclosed garden" defined by tall shrubs (Figures 5, 6, and 7). Additionally, several gestures of the dance choreographies provide a measure of the space (Figures 1 and 6), shaping in it a new intimacy or coziness – which happens somehow unexpectedly given the public context – and hinting at other (unconventional) possible ways of using or enjoying the place (Figures 6 and 7).

Figure 5. (a) "Sudden jolting," (b) "Condensed groove sliding," and (c) "Off-balance craning" at the former Fur Farmers building

Figure 6. "Static planking" at the public staircase along 11 Street SE

Figure 7. (a) "Awkward cocooning" in a sculptured tree near the Art Point building; (b) "Gratified nesting" in a shrub-screened meadow on the Jefferies Park's hillside

Respect for the environmental and socio-cultural value of the place's ecology

The emphasis on the human scale and the human body as a measuring tool in the urban landscape is intertwined with the intent to go beyond a merely anthropocentric view by imaginative application of "more-than-human" lenses and "expanded phenomenology."[21] The dancers' choreography embodied more-than-human actions and phenomena evoking the site's multiple inhabitants (fauna and flora) (Figures 7b and 10a), as well as environmental conditions and their transformational power over time through the cycle of seasons and the passing of eras (Figure 8). By means of their artistic expression, the need for a more intimate relationship with nature – even in a context like cities where it survives as an impoverished fragment[22] or a too-manicured ornament – was celebrated. This celebration speaks to the value of ecological design, biophilic[23] design, nature-based solutions, and increasing ecosystem services[24] in the urban environment. Critical components of the landscape architecture's scope, such as preserving permeable soil as vital to the habitats and the water cycle, expanding the urban tree canopy, and implementing green infrastructures, through the site-dance work emerged as potentially rich in social and cultural value.

Figure 8. "Persistent withstanding." Embodying the building weathering the elements at Art Point

Landscape's materiality and sensuous stimuli

The quality of the dancers' movement and the micro-scale of their gestures amplify the landscape's materiality (Figures 9 and 10), showcasing its grain with greater detail and engaging tactility and other sensuous stimuli,[25] including an emphasis on the sound. These aspects are essential to landscape design and refer to both stable, perduring materials and ephemeral phenomena. Designing with ephemeral conditions and components, instead of physically and permanently altering the context, also relates to the first design principle introduced above, "minimal intervention."

Additionally, there is a playfulness generated by the interaction with soft materials such as a pile of leaves or a tree mulch and the soil on the ground surrounding the tree (Figure 10), which is inspirational for the design of "softscapes" (where natural components such as vegetation and permeable soil prevail), as an alternative to too widely spread hardscapes made of impervious materials. The latter deplete biodiversity and constitute a well-known issue concerning stormwater management and our response to the consequences of climate change in the built environment.

Figure 9. (a) "Curious line-tracing," (b) "Tactile investigating," and (c) "Heavy foot-shuffling" in the industrial heritage area

Figure 10. (a) "Punctured eroding" of a tree's trunk; (b) "Indulgent stretching" out of a leaf pile; (c) "Cross-body rubbing" with/of the earth on the ground

CONCLUSION

One of the critical objectives of this project was to "record" and "reveal" the aura of Ramsay and Inglewood neighborhoods in the context of major urban transformations being planned, such as the implementation of the new LRT line and related Transit Oriented Development (TOD). While recognizing the significant benefits that the city plans will bring to Calgary and the local communities of Inglewood and Ramsay, the risk of triggering gentrification processes and "erasing" the unique history and character of these places – thus losing stories and memories that are part of their identity – strongly concern us and inspired this project. Through the mapping, the perspective view scenarios, the photographic repertoire, and the dance films, the planned "recording" and "revealing" work is now completed and provides artistic outputs. Further reflection on how our interdisciplinary methodology can impact or translate into landscape design processes is currently underway. By remaking the design concepts discussed in this paper, the intention is to foster a more sensitive, delicate way to read and transform the cities in which we live.

NOTES

[1] The Landscape in Motion project draws on research supported by Canada's Social Sciences and Humanities Research Council (SSHRC) through an Insight Development Grant awarded in 2019. The project benefits from consultation with landscape ecologist Dr. Mary-Ellen Tyler, community members and project consultants Jennifer Mahood, Chantal Wall, and Linnea Swan, cinematographers, and Robin Tufts, musician (environmental percussionist). We are thankful for the valuable contribution of research assistants Gordon Skilling, Thu Ngo, Bushra Hashim, Emily Kaing, Zoe Crandall, Anna Toneguzzi, Pranshul Dangwal (with the School of Architecture, Planning and Landscape), and Zoe Abrigo, Cindy Ansah, Stephanie Jurkova and Alyssa Maturino (with the School of Creative and Performing Arts), University of Calgary.

[2] Enrica Dall'Ara and Melanie Kloetzel, "Landscape in Motion: Score-Maps, Design Processes and Choreographic Creation," in *AMPS Proceedings Series 20.2: Connections: Exploring Heritage, Architecture, Cities, Art, Media*, University of Kent, UK, June 29-30, 2020, ed. Howard Griffin (2020), 164, https://architecturemps.com/wp-content/uploads/2021/03/Amps-Proceedings-Series-20.2.pdf

[3] The City of Calgary Land Use Planning & Policy, Planning, Development & Assessment, Calgary Heritage Authority, *Ramsay Historical Context Report* (2013), https://static1.squarespace.com/static/5d8ce4980ed4467c0bc04947/t/624df649c8d3be3aee38d94d/1649276500 161/Ramsay+historical+context+paper.pdf

[4] Dall'Ara and Kloetzel, "Landscape in Motion," 161-172.

[5] Inspirational for our project were the "Motation" drawings by American landscape architect Lawrence Halprin. "Motation" acts as a score that can "describe motion through spaces" as "a tool for choreography as much as description; choreography in the broadest sense-meaning design for movement." Lawrence Halprin, "Motation," Progressive Architecture 46 (1965): 130.

[6] Melanie Kloetzel, "Decolonizing Site-Specific Performance Methodologies: Preliminary Steps," Contemporary Theatre Review, 34, no. 2 (2024, in Press).

[7] David Abram, *The Spell of the Sensuous. Perception and Language in a More-Than-Human World* (New York: Vintage Books, 1997).

[8] "…the minimal intervention is to bring other tangible dimensions to what is already there." Bernard Lassus, "The Obligation of Invention (1998)," in *Theory in Landscape Architecture. A reader*, ed. Simon Swaffield (Philadelphia: University of Pennsylvania Press, 2002), 68; the idea and strategy of "minimal intervention" was promoted in the 1980s by Lucius Burckhardt, whose seminal works have been recently collected in the book *The Minimal Intervention*, eds. Markus Ritter and Schmitz Martin (Berlin, Boston: Birkhäuser, 2022).

[9] Lassus, 68.

[10] Giunta Regionale Lombardia, *Linee Guida per l'esame paesistico dei progetti,* Bollettino Ufficiale della Regione Lombardia, November 21, 2002. https://www.consultazioniburl.servizirl.it/pdf/2002/03472.pdf#Page=2.

[11] In Burckhardt's perspective, the "minimal intervention" "…aims to influence the viewer's imagination by means of signs" and "when used consciously, …is a ploy of the artistic kind." Burckhardt, The Minimal Intervention, 141. How places can reveal or acquire meaning and value by means of signs is also addressed in Enrica Dall'Ara, *Costruire per temi i paesaggi? Esiti spaziali della semantica nei parchi tematici europei* (Firenze: Firenze University Press, 2005), and Enrica Dall'Ara, "Appunti per il progetto dei parchi del divertimento a tema," in *Paesaggio. Didattica, ricerche e progetti*, ed. Guido Ferrara et al. (Firenze: Firenze University Press, 2007), 213-225, doi: 10.36253/978-88-6453-123-6.

[12] Michelle Corajoud, "Le projet de paysage: lettre aux étudiants," in *Le Jardinier, l'Artiste et l'Ingénieur*, ed. Jean-Luc Brisson (Besançon, Paris: Editions de l'Imprimeur, 2000), 47.

[13] Referring to the etymological broad meaning of the Latin word "limen," threshold.

[14] "Ecotones are areas where ecological communities, ecosystems, or biotic regions coincide. They often occur in areas of steep environmental transition, along environmental gradients." Salit Kark, "Effects of Ecotones on Biodiversity," in *Encyclopedia of Biodiversity*, ed. Simon Asher Levin (Amsterdam: Elsevier, 2007), 1, doi: 10.1016/B978-012226865-6/00573-0; "As suggested by Odum (1953), they do not simply represent a boundary or an edge; the concept of an ecotone assumes the existence of active interaction between two or more ecosystems with properties that do not exist in either of the adjacent ecosystems." Kark, 2.

[15] Clemmensen, Daugaard, and Nielsen promote the concept of "The Edge as Site," highlighting that "edges are seldom considered sites in their own right but rather as boundaries between different sites. As a consequence, enclaves and other entities that turn their backs to each other, expressing a lack of communication on all levels of influence from physical appearance to appropriation, characterise many edge conditions. What could be an

important site of connection and exchange is in many cases simply ignored or treated as marginal space." Thomas Juel Clemmensen et al. "Qualifying urban landscapes," Journal of Landscape Architecture, 5, no. 2 (2010): 34, doi: 10.1080/18626033.2010.9723436.

[16] Yuhang Luo et al. "Using stepping-stone theory to evaluate the maintenance of landscape connectivity under China's ecological control line policy," Journal of Cleaner Production, 296 (2021): 2, doi: 10.1016/j.jclepro.2021.126356.

[17] Wenche Dramstad et al. *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning* (Washington: Island Press, 1996), 22.

[18] "Small patches can serve as stepping stones, allowing for species movement between large patches and are important in fragmented landscapes." Gary Bentrup, *Conservation Buffers. Design Guidelines for Buffers, Corridors, and Greenways. Gen. Tech. Rep. SRS-109* (Asheville, NC: Department of Agriculture, Forest Service, Southern Research Station), 52, https://www.fs.usda.gov/nac/buffers/docs/conservation_buffers.pdf.

[19] George Perec, "Species of Spaces / Especes d'espaces (1974)," in *Species of Spaces and Other Pieces*, ed. John Sturrock (London: Penguin Books, 2008), 1-96.

[20] "…every angle in a room, every inch of secluded space in which we like to hide, or withdraw into ourselves, is a symbol of solitude for the imagination; that is to say, it is the germ of a room, or of a house." Gaston Bachelard, *The Poetics of Space*, trans. Maria Jolas (London: Penguin Books, 2014), 55.

[21] Kloetzel, "Decolonizing Site-Specific Performance Methodologies."

[22] "…modern cities have literally dispersed and camouflaged the natural substrate of their sites. Many of these substrates have been altered beyond recognition: waters have been covered or diverted, topographies erased or manipulated, forests shredded or fragmented…" Christophe Girot, "Vision in Motion: Representing Landscape in Time," in *The Landscape Urbanism Reader*, ed. Charles Waldheim (New York: Princeton University Press, 2006), 92.

[23] Biophilic design refers to architectural solutions that focus on the relationship between people and nature. It pertains to the concept of "biophilia," "A word used by the American ecologist Edward O. Wilson (b.1929) to describe the affinity of different living species for one another and specifically the interdependent bond, as well as the affinity, between humans and other species of plants and animals. Wilson makes explicit the role of biophilia in maintaining sustainable global ecosystems and population health." Miquel Porta, "Biophilia," in *A Dictionary of Public Health*, ed. John M. Last (Oxford University Press, accessed August 2, 2023), https://www-oxfordreference-com.ezproxy.lib.ucalgary.ca/view/10.1093/acref/9780191844386.001.0001/acref-9780191844386-e-443. According to Gunnarsson and Hedblom, the "biophilia" hypothesis, i.e., humans' "unconscious and innate need to affiliate with nature and living organisms," is "both increasingly accepted and questioned." They highlight how "The interplay between inheritance and environment, including culture, governs an individual's response…" to nature. Bengt Gunnarsson and Marcus Hedblom, "Biophilia revisited: nature versus nurture," Trends in Ecology & Evolution, 2023, 1, doi: 10.1016/j.tree.2023.06.002. Variety in urban green spaces, regarding "size, configuration, and biodiversity," is fostered as it optimizes benefits for diverse city inhabitants. Gunnarsson and Hedblom, 3.

[24] The concept of ecosystem services relates to societal benefits generated by natural ecosystems. Klaus Birkhofer et al. "Ecosystem services—current challenges and opportunities for ecological research," Frontiers in Ecology and Evolution, 2 (2015): article 87, doi: 10.3389/fevo.2014.00087; Alessio Russo and Giuseppe T. Cirella, "Urban Ecosystem Services: Current Knowledge, Gaps, and Future Research," Land 10, no. 8 (2021): 811, https://doi.org/10.3390/land10080811.

[25] Enrica Dall'Ara and Melanie Kloetzel, "Scaling Up and Down: Landscape design processes and choreographic inquiry," in *Proceedings of Nordes 2021: Matters of Scale*, 15-18 August 2021, Kolding, Denmark, ed. Eva Brand et al. (Nordes - Nordic Design Research, 2021), 448, https://doi.org/10.21606/nordes.2021.53.

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ASSESSMENT OF POST-DISASTER LIVING CONDITIONS OF THE NEW VICTIMS OF BHOPAL GAS TRAGEDY

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INTRODUCTION

The identity of Bhopal city which was once notoriously known for being the site of the one of the deadliest industrial disasters in history has successfully steered clear of its ignominy over the last couple of decades. Although now renowned as the "city of lakes", the reality Bhopal's past is inseparable from the perils of its present shape and state. The toxic material continues to rot at Bhopal's Union Carbide site while the new victims continue to live by it, still awaiting justice.[1] The catastrophe took place five hours past midnight on the 3rd of December 1984; Medical and government organizations were unaware of the consequences and were unable to respond to the tragedy and Union Carbide Corporation, did little to help.[2] The tragedy that took place that night still unfolds to this day, because of incompetent and callous response. Over three decades later, there is still no closure.[3]

The Tragedy

An industrial disaster refers to a catastrophic event that occurs in an industrial setting.. These incidents often result in significant human casualties, environmental damage, and economic losses.[4]
Methyl Isocyanate spewed out of the Union Carbide factory in Bhopal and spread over forty sq km in a matter of hours, and the consequences were faced even by the people residing up to tens of kilometers downwind.[5] The safety device at the factory had been off and unmonitored for weeks, and a faulty valve had let out a plume of gas into the city on the morning of third of December. With no warning or emergency system in action, a major portion of the city had turned into a gas chamber[6] and about 200,000 residents had inhaled the poison. Several slums that lay adjacent to the plant saw about 3,800 immediate deaths.[7] The only entities that stood against a bigger disaster were the lakes of the city which partially neutralized the cloud of gas that spread through the city.[8] Bhopal lacked proper road network and transport for emergency evacuation in 1984, which caused the workers to move on foot through crowded areas, while people slept on pavements and railway platforms. The medical facilities were inadequate and there was no knowledge of what the poison was and how it was going to impact the city. The subsequent couple of decades saw about 20,000 premature deaths while estimates within the first few days ran as high as 10,000. About 500,000 people that were exposed to the gas showed significant morbidity and increased mortality during the studies that were conducted soon after.[9]

All authorities such as the local government, Indian government, and the Union Carbide Corporation who were responsible for the tragedy avoided accountability.[10] The computerization of the number of people wasn't carried out and victims were held back from receiving compensation by the Madhya Pradesh Government.[11] The government also curbed healthcare facilities and facilitators from sharing any information with the public.[12] The coordination between hospitals and the Gas Relief Department failed as well. Records by "The Department of Bhopal Gas Tragedy Relief and Rehabilitation" show that revanchism of the disaster required about 8.1 billion dollars and only one seventh the amounts were claimed by the government.[13] Union Carbide discontinued its operation in Bhopal but refused to clear up the site of all the toxic residues. A solar evaporation pond stands beyond the factory grounds that acted as an outlet for the factory waste.[14] The plant continues to pollute the air and water body that surrounds it, which happens to be the only legacy left behind for the people of Bhopal,[15] by Warren Anderson who fled the country and never returned to face trial.[16]
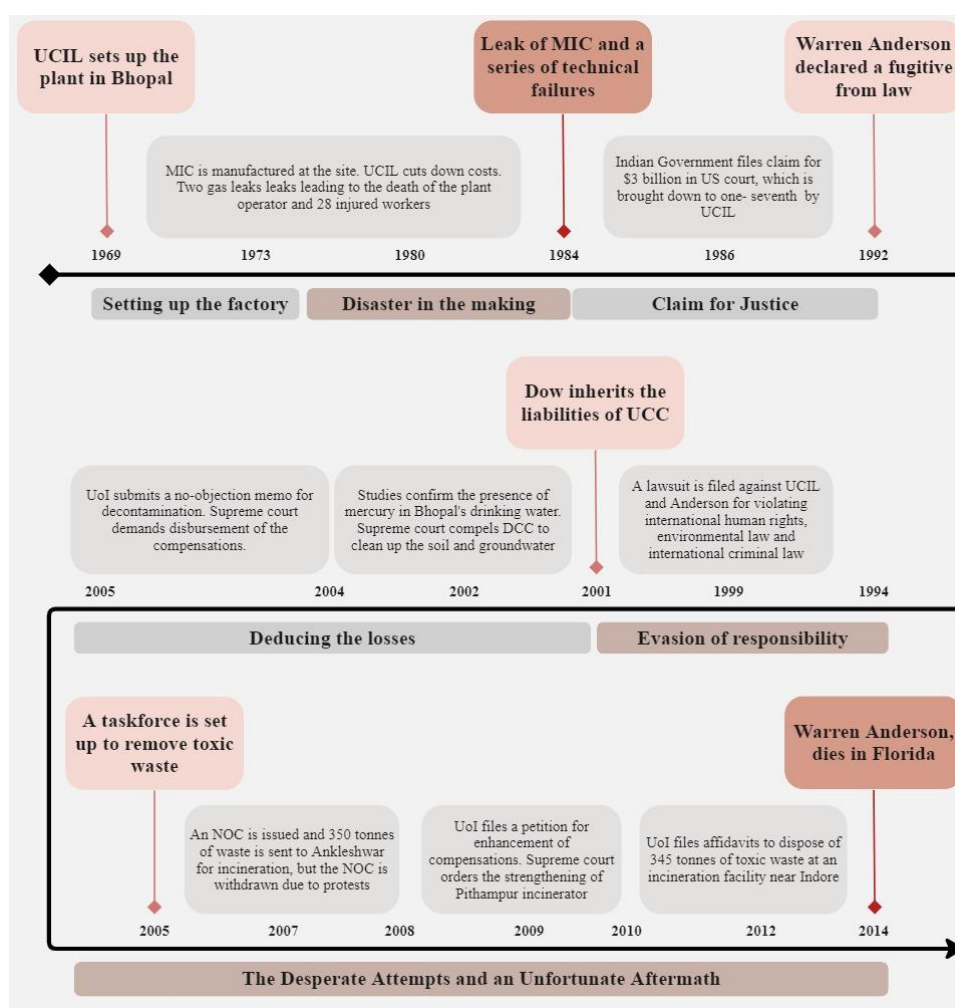
Figure 1. Timeline of the disaster

The New Victims

A major chunk of the population of survivors is spread across a few slums and squatter settlements in Bhopal.[17] These slums have been treated like grey patches for years, and there has been no upgradation. Most residents being illiterate are still unable to completely process the disaster and estimate its hazards to take remedial measures. Thirty-eight years after the tragedy ruined the lives of

over 500,000 people, killed over 5,000; hundreds of families continue to reside by the high compound walls and barbed wires that surround the dilapidated Union Carbide plant.[18] Many of these slums and neighborhoods have existed ever since before the plant came into existence and new ones have come up on abandoned lands in the vicinity.[19] The chemicals will remain in the environment and harm the residents for decades unless they are completely cleared, and the factory is decontaminated.[20] Compensations were handed out to the entire city; due to the lack of legitimate data about the victims, over 570,000 people claimed money that accounted for 70% of the population.[21] While the families of the victims were supposed to receive 2-3 lakhs as compensation, the final amount that was paid over the period of six years only added up to Rs.15,000 per victim.[22] There have been multiple protests and pleas from survivors and the families of the dead to have the case reopened, but the courts and governments have repeatedly dismissed the case of compensation settlement.[23] There are several organizations that provide health programmes, skill training and economic support for the victims of the tragedy.[24] They represent them and urge the governments to provide them with additional compensations. Sambhavna trust[25] and Chingari Rehabilitation Centre[26] are two such organizations that provide free traditional and western healthcare to the victims, organize regular seminars, training programmes and traditional therapies, and emphasise on the participation of local communities.

City Profile and the Selection of Study Area

The city of Bhopal- the site of the world's worst industrial tragedy is classified into four distinct districts based on its chronological evolution.[27] The Union Carbide factory lies further towards the brims of the city on the north, completely disregarded, in a desperate attempt to mask its painful past.[28] Two neighborhoods lying beside the factory are taken into consideration for this study, to understand the relationship of their built environment and the social structure – Jaiprakash Nagar and Kechi Chola; both neighborhoods exist within 100 meters from the Union Carbide factory. Elaborate discussions, interviews and sampling have been done on both sites. The neighborhoods have been selected as they are in a prime location, implying that they underwent the highest degree of environmental and physical damage. Both the sites are occupied by slums belonging to the low-income strata and are in dire need of improvement. The morphology of these slums has been studied in terms of social groups, physical conditions, economic status, and citizen welfare.

Methodology

The study is both qualitative and quantitative in nature. Two low-income residential neighborhoods affected by the tragedy are studied, and a comparative study is then presented. The issues faced by the victims are analysed on a neighborhood level, household level and on an individual level. Settlements in these neighborhoods are studied based on their socio-economic wellbeing, connectivity, built environment and their corresponding spatio-temporal vectors.

Qualitative descriptive studies are carried out to identify the current situations of the residents, needs and problems that aid in discovering and portraying multiple views on the case. Biases are negated by identifying legitimate focus groups and finding multiple realities. All the arguments presented in the paper are backed by quantitative data pertaining to physical infrastructure. Physical features of households are analyzed based on instrument readings and observations to draw an idea of the existing structural homogeneities and heterogeneities.
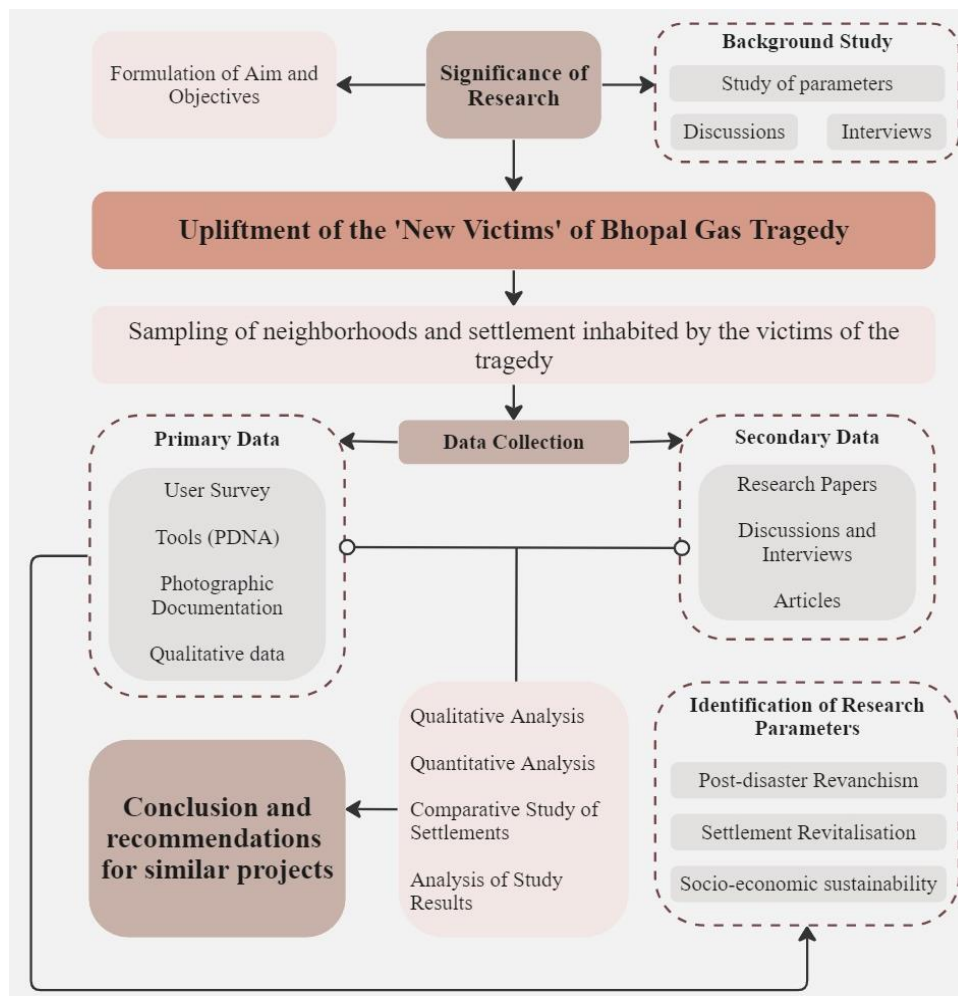
Figure 2. Methodology chart for the study

ASSESMENT OF LIVING CONDITIONS
Neighborhood Level
Socio-economic Wellbeing

Given the context of slums, sustainable development can be defined as "any development leading to social upbringing by way of economic growth, with the help of physical planning with minimum damage to environment".[29] Communities, communal spaces, and living spaces are studied for the better understanding social fabric in both neighborhoods; people belonging to different religions and social divisions live together and exhibit strong social links and well melded communal ties. They are dependent on each other for livelihood and economic sustenance.[30] The slums have developed organically over time; most victims residing in these settlements were associated with the factory and were dependent on it for employment.[31]

ENVELOPED BY METHYL ISOCYANATE
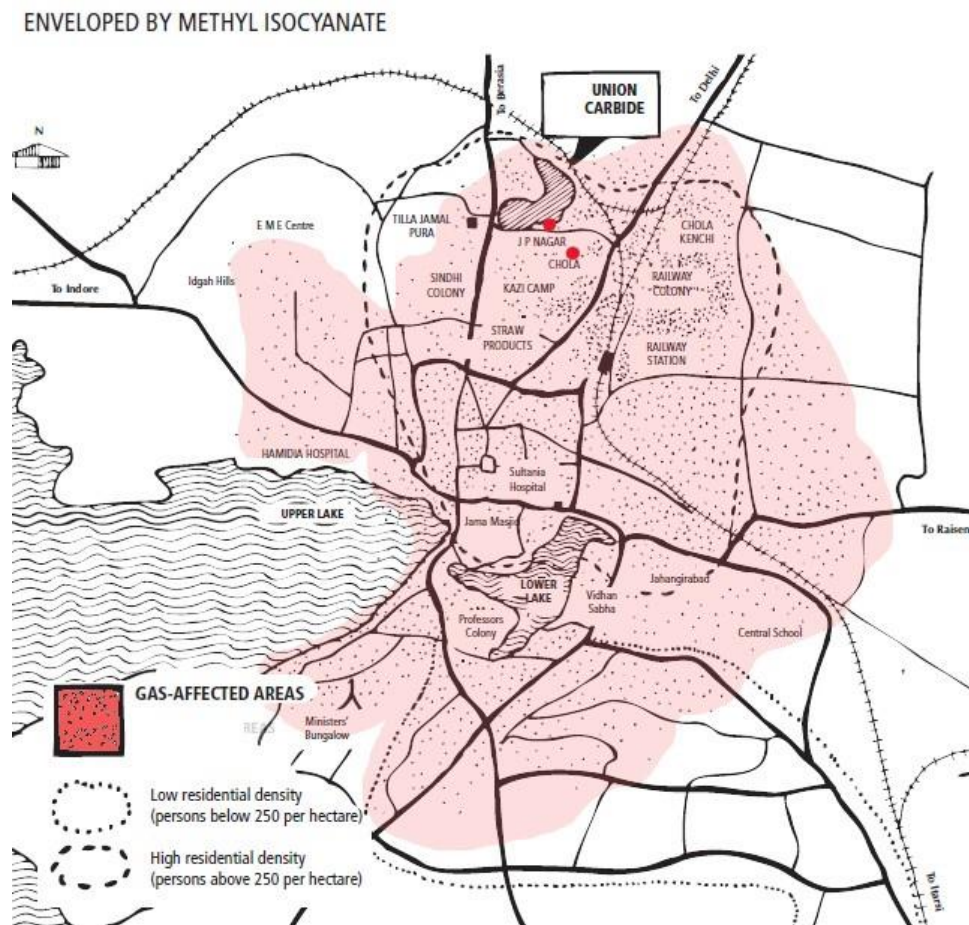
Figure 3. Areas in the city affected by gas and neighborhoods identified for the study[32]

The narrow streets of these slums do not facilitate vehicular movement. They are instead used as livelihood spaces; the adults can be seen sitting in front of their houses, having conversations while the kids of the neighborhoods turn the streets into a playground. Residents of slums and informal unauthorized settlements are rehabilitated with security of tenure, social services, and basic amenities, under the objectives of BSUP.[33.]

Most of these families have also lived in these slums for over half a century and due to being economically unstable they continue to live here despite the threats of the factory. The neighborhoods being on the fringes highly impact the livelihood of the people. Job opportunities in this part of the city are extremely limited. Being cut off from the affordable public transport system, residents are forced to commute to their workplaces by foot. The jobs of the earning members of the family are insecure by nature. It is observed that the number of people employed in the tertiary sector consisting of clerical, management, technical and administrative sectors was extremely low in number.

Figure 4. Occupation and source of income of the residents

Settlement Revitalization

These neighborhoods are still plagued with health issues, and their current living conditions do little for their betterment. Being informal in nature, these slums have an extremely poor quality of living, lack adequate facilities, and have no protection from possible disasters or threats. Both slums are located on the periphery of major roads. The land use of these zones is marked as environmental sensitive according to the master plan, despite of which it consist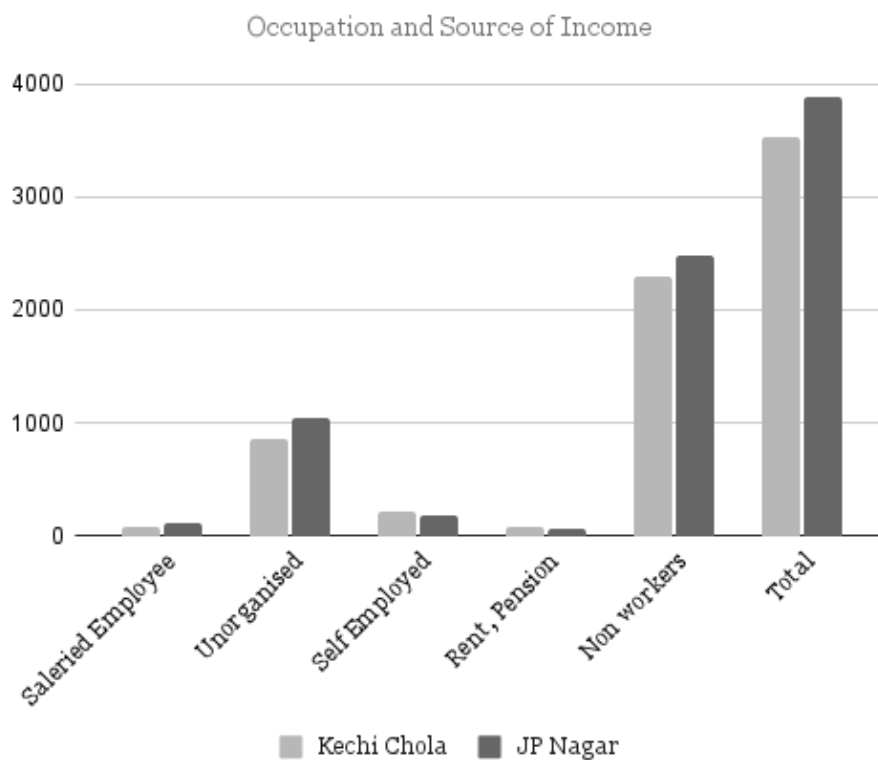s of 70% residential spaces, 20% commercial shops and 10% public spaces. The streets for internal circulation are narrow and congested and are either kuccha (crude or in a raw state) roads or CC roads with unplanned settlements. Vehicular movement in these streets is not possible, which acts as a threat in case of emergencies, accidents or floods and the movement of ambulances or fire brigade would be curbed. The neighborhoods have only about 5% open spaces that are undefined and unused. The settlements are adjoined to each other with no buffer spaces in between, making the slums appear crammed with no inlet or light or ventilation. Most streets lack streetlights and the ones that are present do not function, this tampers with the safety of people. There is no formal system for the supply of electricity, potable water, and disposal of garbage, proper drainage, sewage, and sanitation in studied areas. These slums are in low lying areas in extremely poor and unhygienic conditions and are susceptible to water logging that makes them vulnerable to various diseases. Sanitation and hygiene are severely neglected in both areas of study; the slums mostly have open drains. The main pipeline for sewage flow is only three to four inches wide and is used for a few blocks of houses in Jaiprakash Nagar. This width is often insufficient to carry the load of sewage. The residents of Kechi Chola also complain that their sewage drains often overflow, causing the filthy water to flow into houses. There is no provision for the collection of garbage regularly from Kechi Chola, which leads the residents to

throw out the garbage in the open or on the streets. Jaiprakash Nagar however is facilitated with daily collection of garbage by the municipality; however the workers fail to visit the neighborhood regularly. Littering and heaps of garbage and waste on the streets can still be observed due to the lack of public dustbins and proper waste segregation on a household level.

The residents of both Kechi Chola and Jaiprakash Nagar receive potable water through taps for thirty minutes every morning. The wells located near the neighborhoods contain contaminated water that cannot be used for daily chores. The residents most often rely on a distant well, unable to use the polluted water stagnated in their slums. The residents claimed that even washing with the well water caused health complications; they could even see their utensils corroding due to the toxic chemicals present in the water. Drinking water lines could be seen passing through sewage in Kechi Chola. The water previously being used in these neighborhoods was seen to cause itching, burning sensation and blisters.[34] Water tanks have been installed on the roofs of each house in Jaiprakash Nagar. These tanks are being fed by the big overhead tank present in the settlement area. Most houses in these neighborhoods do not own purifiers and have no alternate source for drinking water. The quality of the water does not meet hygiene standards and the cleanliness of the tanks is also not ensured.

There have been many organisations that provided the victims with economic rehabilitation and helped them with skill development training programmes. However, the victims claim that these programmes didn't last long and were shut down within a few months of implementation.[35] Proper monitoring of these initiatives should be ensured. Participation of the communities is crucial for the betterment of the socio-economic status of the people who are adversely affected by the environmental degradation.
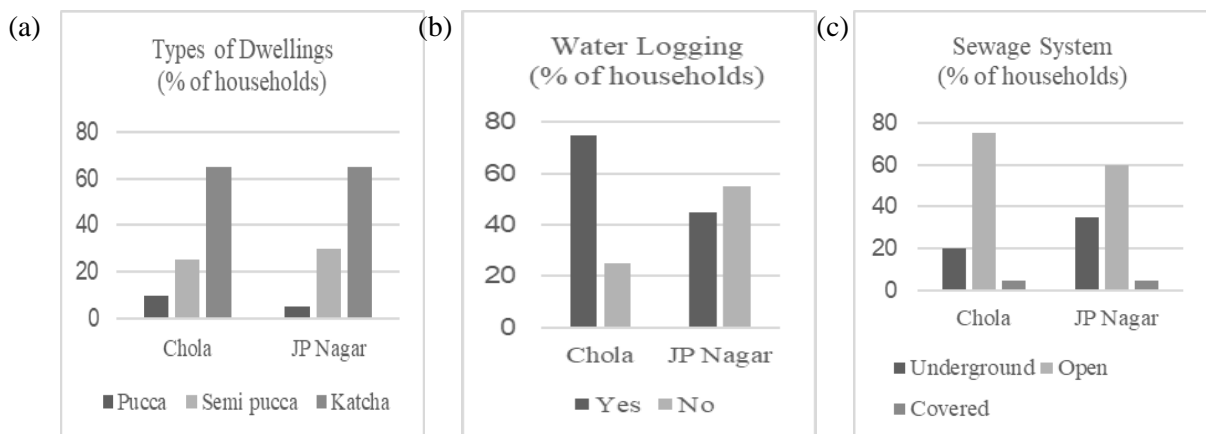
Figure 5(a) Types of Dwellings in the Neighborhoods; 5(b) Water logging in the neighborhoods; 5(c) Sewage system in the neighborhoods

Household Level

Socio-Economic Wellbeing

Most people from the study areas are dependent on the markets at Bhanpur and Jumerati and the HIG colony which are located within 2-3 kilometers of their livelihood. Most of them work in the informal sector as construction laborers, house help or welders. The neighborhood lacks facilities such as convenience or retail stores. Discussions with the residents revealed that most of the residents wished to be self-employed and self-reliable if given an opportunity. Having secure jobs that guaranteed a level of stable income was a close second choice. The occupants, being descendants of people who previously worked at or were associated with the factory did not have the possibility of having a hereditary occupation- something that can be commonly seen among the urban poor.

(a)

Drainage system (% of households)

```
80
60
40
20
0
        Chola        JP Nagar
```
■ Open kutccha ■ Open pucca
■ Closed

(b)

Toilets (% of households)

```
80
60
40
20
0
        Chola        JP Nagar
```
■ Personal ■ Open ■ Communtiy

Figure 6(a). Drainage system in the Neighborhoods; 6(b). Types of toilets in the neighborhood

Settlement Revitalization

Most dwelling units in both neighborhoods are in a very poor condition and most of them are kutcha in nature. The houses require constant repairs to maintain livable conditions. Most settlements are single storied and are unplanned. The average area of these houses is about 300-400 sq ft, and most of them have about 1-2 rooms, with 5-8 people residing in them. Most of the houses in Jaiprakash Nagar and Kechi Chola are built of RCC and tin roofs, the material used for walls mainly consisted of mud are and brick in Jaiprakash Nagar while in Kechi Chola, the houses are made of tin walls. Jaiprakash Nagar, having existed for longer has settlements that are more permanent in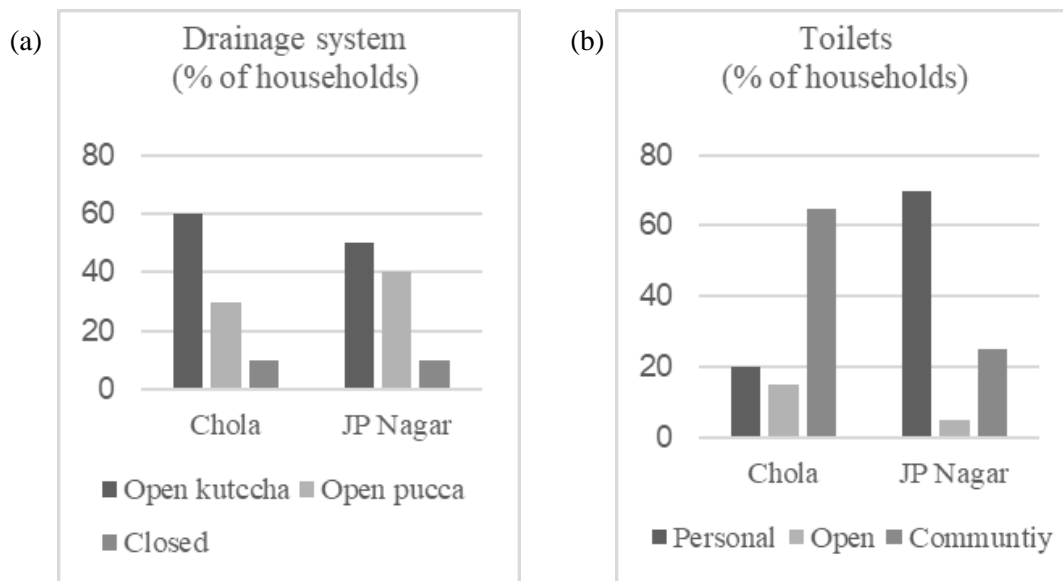 nature. The houses being constructed of tin fail to buffer outdoor heat and leads to increased temperature and humidity of the interiors, beyond comfortable levels. Most of these houses only have one window, cancelling out any possibility of cross ventilation, making the indoor environment extremely hot and humid. The absence of windows and the densely packed houses allow very little light to enter the living spaces. The houses in these slums do not have an electricity connection provided by the municipality. They rely on private agencies for electricity and are highly overcharged for it. These households receive electricity for only up to 5-6 hours a day. Households of Jaiprakash Nagar are equipped with personal toilets in 2018 as a part of the Swachh Bharat initiative, but the residents of Kechi Chola use community toilets that are in dilapidated conditions.

There has been very little to no improvement in the physical structure of these slums; rather on many fronts, the living conditions have only worsened. The urban poor in these slums are the agents and the victims of environmental degradation.[36] Lack of provision of water supply, drinking water, sanitation, garbage collection and health care facilities creates a condition where infectious and parasitic diseases thrive and spread.[37] The long-term solution to the water related problems faced by the slum dwellers would be to speed up the various pipeline schemes which are expected to bring water from the Bada Talab (big lake) and Kolar dam. A separate water supply channel that allows the residents to store running water for consumption could be beneficial for the residents. Community management systems should be made and enforced by organizations to teach individual families to carry out waste disposal efficiently.[38]
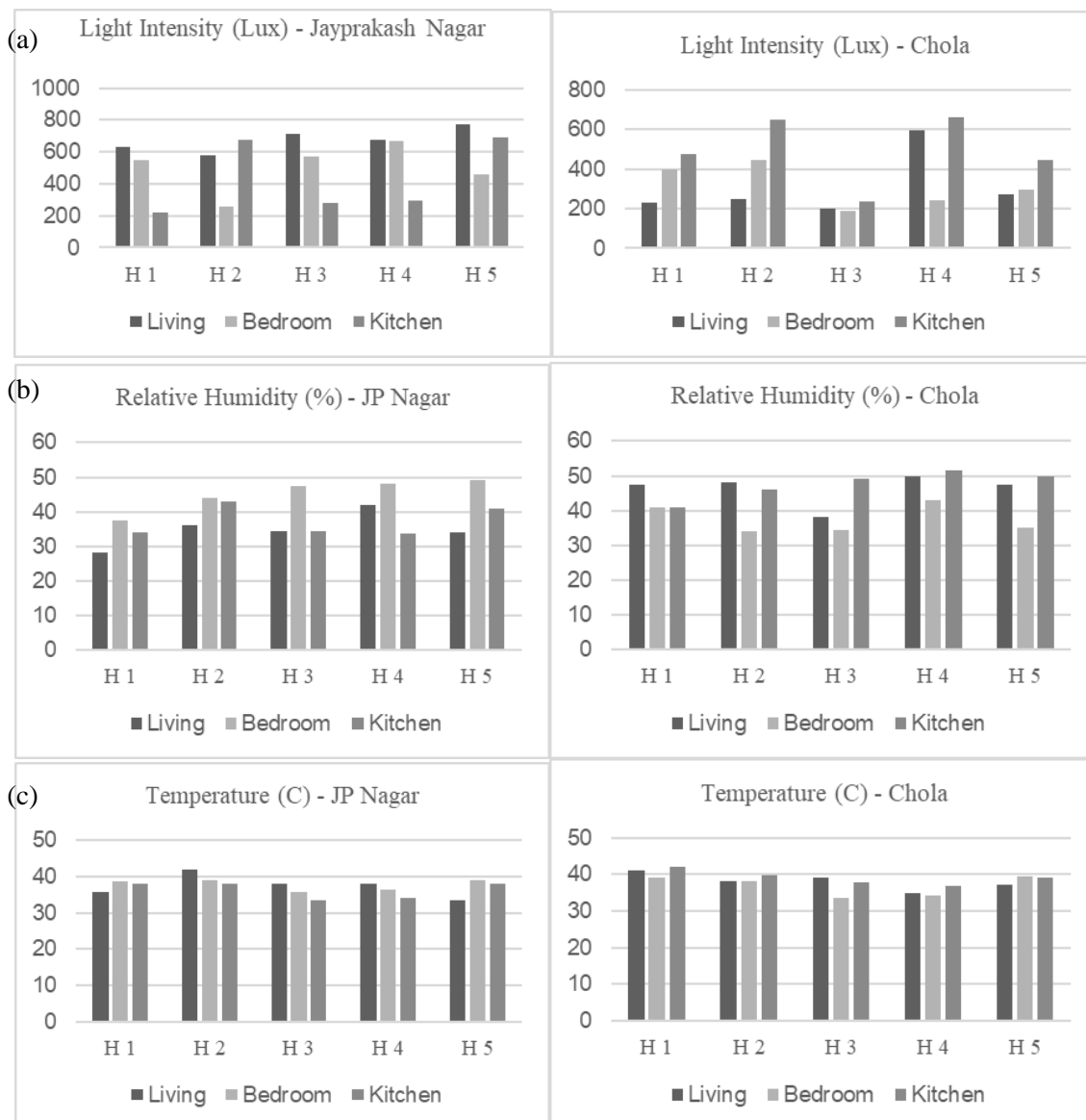
Figure 7(a).Comparison of light intensity levels in the households of Jaiprakash nagar and Kechi Chola; 7(b). Comparison of light intensity levels; 7(c). Comparison of indoor temperatures

Individual Level

Illiteracy and unemployment are the two biggest shortcomings of the communities living in these neighborhoods and the major reasons for below satisfactory living conditions. The residents are unaware of the efforts, social services and schemes put forward by the state and the municipal governments for education, rehabilitation, job opportunities, skill training etc. It reflects how government agencies fail to educate the people about their rights.[39] The government schemes running in Bhopal city need urgent review as they have not been able to bring in much difference.[40] It is also observed that the indebted minority groups depend mostly on the cooperative/government banks, much more in comparison to the commercial banks due to inaccessibility. As people continue to live on the polluted grounds, upgrading and reallocation of slums in these neighborhoods is needed urgently to deal with the people's present-day problems and to avoid any threat that may plague them in the coming years. Since uprooting the slums altogether isn't a viable option for the residents, the people living in around the factory should be uplifted and should be made aware of the situations they

are living in. Emergency procedures should be taught. They should be well versed with nearby medical facilities. Emergency evacuation, circulation for fire brigades and ambulances should be facilitated with ease. People should be taught about various welfare schemes and should be well versed with voluntary organizations that can provide help and should be involved in the disaster management process.[41] Encouraging transparent public hearings and public data disseminations would help make people aware of the rights and schemes that could help them, and it should be ensured that they get an opportunity to put forward their problems in a way that they are heard.[42]

CONCLUSION

The paper deals with the new victims and their present living conditions and problems. The analysis helps identify specific problems faced by these slums post-disaster to prioritize and come up with appropriate interventions. Urban local bodies and other governments have regulated different programs for the upgradation of slums and the urban poor without considering the variations in nature of problems faced by them. These policies are highlighted in the paper, but the recommendations are irrespective of the policies and programs which are currently not being acted in accordance with. The problems prevalent in the study areas are multidimensional and include physical, environmental, and socio-economic issues. Case studies presented in the paper provide suitable sources to obtain details that can be used for further evaluations and the blueprint of the study can be used in other similar cases as well. Transferable judgments can be made by readers and other stakeholders such as planners, administrators, socialists, and the communities themselves. Based on the findings and responses of the residents, the general theme raises considerations that can be useful in various contexts. Studies that use a similar framework can validate and utilize the findings of the study for further recommendations.

The paper inspects the settlements both as physical environments and as a spot for social relationships. It calls for a more comprehensive approach to investigate socio-spatial relationships. "One size does not fit all." Various stakeholders such as Organizations, Governmental policy makers, Urban planners, Administrators, and the community itself should work together to come up with a holistic solution to cater to all the needs amalgamated. The standard of living of people can be improved through a better and safer social and physical environment, enforcing suitable policies, and better infrastructure. This will further increase the productivity of the urban poor leading to a sustainable and inclusive society.

In disaster struck, poor urban neighborhoods like JP Nagar and Kechi Chola having a constricted amount of land and resources, it is important to enforce a fair and impartial distribution of resources and provide the people with adequate opportunities, for them to be able to pull themselves out of their plight. The Post Disaster Needs Assessment (PDNA) India lays down a set of guidelines based on scientific approaches for long-term recovery and reconstruction after such disasters; the damages need to be assessed and suitable measures should be taken to revitalize these neighborhoods.[43] Active participation of communities exposed to hazards is crucial for proper health and environment surveillance alongside the systems for monitoring. There have been several smaller industrial accidents in the country after the Bhopal Gas Tragedy which were overlooked.[44] Hazardous waste piled up in various cities within the country which haven't been cleared, contaminates water, and land, and continues to endanger lives. The technological advances since the tragedy may have improved but there is still a state of uncertainty in many places that are treated as dump yards for chemical waste.[45] Awareness needs to be generated and people must be trained and prepared for any similar occurrences in the future.
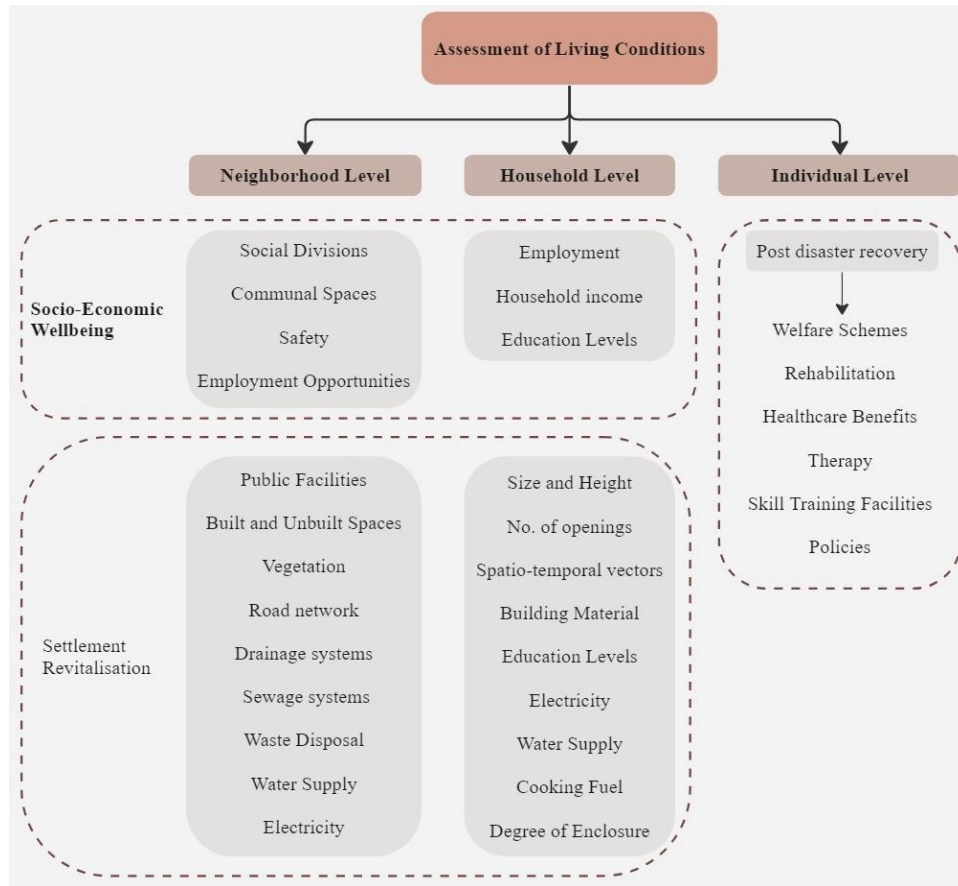
Figure 8. Framework to assess post-disaster living conditions

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ACCELERATING GRID-BASED RENEWABLE ELECTRICITY SECTOR TRANSITION IN NIGERIA

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INTRODUCTION

Globally, there is a drive to transition fossil fuel-dependent systems to cleaner alternatives. The focus is to make renewable energy (RE) central to electricity generation. Nigeria and most sub-Saharan African countries are faced with climate change issues and a challenging situation of energy poverty due to limited energy supply and low access. This has had a spiral impact on the country's economy and the livability of its 40 cities (with each city having a population of over 300,000) and hampers sustainable development.[1] The energy supply of 5300 megawatt (MW) peak generation capacity is grossly inadequate to meet 17520MW demand, although there is an enhancement plan to improve the supply on the Nigerian grid from 26%, 48% and 70% in 2016, 2020 and 2030, respectively. In addition, to improve energy access levels to 65% (2016), 75% (2020) and 90% (2030) for urban areas.[2] However, little progress has been made in achieving this target.[3]

Policymakers, planners, and researchers have confirmed RE is a solution to tackle energy challenges and address CO_2 emissions in Nigeria.[4] Though Nigeria contributed about 0.37% of CO_2 emissions globally in 2021 and African countries 2.9%,[5] there are concerns that emissions might increase as the population and urbanisation grow. Several studies have demonstrated the strong linkage between urbanisation, economic growth, energy demand and subsequent CO_2 emissions in countries that rely on non-RE systems, recognising that energy supply is pivotal for economic development and improved quality of life.[6]

About 53% of Nigerians live in urban areas, which is projected to increase to 70% by 2050.[7] Furthermore, population growth, especially in urban areas and cities, is exerting pressure on the existing infrastructure, as well as the energy infrastructure fundamental to cities' livability, with Lagos, being the biggest city with a population of 15.9 million, ranked 170 out of 173 cities in livability with a 53.3% weighting in the infrastructure category which relates to the quality of energy provided by the Economic Intelligence.[8]

To improve the quality of electricity supply, the Government formulated RE policies to accelerate the development of the Nigerian national grid, the primary electricity source for Nigerian cities. However, implementation has remained challenging, with the planning process and governance criticised as problematic with accountability and transparency issues.[9] Existing research has not paid attention to investigating these issues. This could be because the electricity sector has complex and wicked problems from economic, technical and social perspectives.[10] This paper investigates grid RE's planning process and governance and determines how accountable and transparent the process is. The paper seeks to answer the questions:

What are the planning process and governance of grid-RE in Nigeria?

Is the planning process and governance of grid-RE accountable and transparent?

This study argues that addressing the planning process and governance challenges especially elements of accountability and transparency will accelerate grid RE development across the 40 cities in Nigeria and promote livability within these cities. Also, it draws on the extant literature on RE development and findings from policymakers, planners, energy, and non-actors. These findings can be utilised to develop and propose recommendations expounding the elements of the planning process and stakeholders that should be involved with accountability measures and transparency goals suggested, which will foster the development of the technologies (solar and wind) on the grid. It will inform Nigerian policymakers and planners on strategies that can be adopted to accelerate electricity transition.

AN OVERVIEW OF THE NIGERIAN RE POLICY

Nigeria has, over time, developed several RE policies, strategies, actions and programmes - see Table 1. The target is to include and increase the share of RE in the national energy mix to solve energy access and security concerns.[11] The policies were developed to improve the electricity sector and increase RE contribution to the total power generation of the country.[12] They also provide frameworks for achieving the Paris Agreement and the Nationally Determined Contributions (NDC).[13] Moreover, the policies are meant to help harness the RE potential of Nigeria since, as of now, there is minimal utilisation, especially from wind and solar energy.[14]

Furthermore, the RE policies were primarily aimed at engendering a system that allows for the development and full utilisation of all the energy resources abundantly available in the country.[15] The RE policies also encourage financing and investment in the RE sector and provide a framework for innovation and technology development in the grid and off-grid connections.[16] Fundamentally, the RE policies aim to achieve improved electricity access and security by introducing RE sources (large and small hydro, biomass, solar and wind) into the country's energy mix.[17]

Documents	YEAR
RE Master Plan, 2005, 2012 (Update)	2013
National RE and Energy Efficiency Policy (NREEEP)	2015
Nationally Determined Contribution (NDC)	2015
National RE Action Plans (NREAP)	2016

Table 5. Major RE policies, strategies, actions and programmes

BARRIERS TO RE DEVELOPMENT IN NIGERIA

Existing literature identifies several barriers to the development of RE in Nigeria. This includes shortcomings in planning, governance, transparency, and accountability.[18]

Cantarero[19] described the various strategic issues that developing countries, including Nigeria, face. Although short-, medium- and long-term plans and investment profiles have been earmarked, little to no programmes and plans are being implemented.[20] Daudu and Idehen[21] also opined that social inequalities are deepened, and socio-economic development is hampered because these issues are not addressed. Furthermore, RE policies that have been created have lacked the efficacy to achieve their purposes.[22] There have been several advancements and innovations in the field of RE globally, Nigeria's policies are out of date and do not address the modern day challenges of RE production and usage.[23] Therefore, there is a need for the continuous update of Nigeria's RE policies to ensure they are dynamic and fit for purpose.[24]

Moreover, Nigeria is faced with high reliance on fossil fuels to cater for its rapidly increasing population. It is a country with significant oil and gas deposits and all the inherent demands result from that, especially for transportation.[25]According to Cantarero[26], there is need for the planning process, which is ineffective to consider social concerns and adequately capture and address in the country's strategic processes and plans. Also, billions of dollars spent annually to subsidise oil production[27] constitute a barrier to introducing RE for electricity generation.

Also, Mostafaeipour et al.[28] identified bureaucracy as another critical issue which impacts RE development. Government and regulatory agencies have created unnecessary structures that impede investments and deter other stakeholders from driving RE, resulting in sluggish implementation. Butu and Strachan[29] also highlighted the lack of participation of key stakeholders in RE project design and execution inhibits successful implementation. Furthermore, because of the lack of transparency and accountable processes, there is a lack of adequate data for analysis. This also acts as a hindrance to the RE powered electricity projects. Elum and Mjimba[30] argued that the existing regulations are weak, coupled with inadequate data, such as market information limiting the effective strategic planning, monitoring and evaluation of RE development processes.[31] Other barriers identified include institutional, market-related, organisational, financial, political, technological, social, infrastructural, and behavioural barriers.[32] This emphasises the need to investigate the strategic planning process and governance relating to the grid RE sector.

THEORETICAL BACKGROUND

This study adopted a socio-technical perspective supported by accountability and transparency concepts in investigating the complexity of the energy system by applying the Transition Management Framework (TMF) and Multi-Level Perspective (MLP). Socio-technical transitions have been used to analyse large systems such as electricity and transportation and are defined by Cherp et al.[33] as the interaction between society and technology that is novel and capable of going mainstream surmounting lock-in. The transition management theory was developed in the Socio-technical literature for accelerating and facilitating energy transition with the TMF and MLP as an offshoot. The MLP is a prominent framework used in strategic planning for energy transitions to understand the changes and dynamics of socio-technical systems along three analytical lenses (socio-technical landscape, regime and niche).[34] On the other hand, TMF is a governance approach used in navigating change to a desired direction towards sustainability.[35] In recent years, it has gained tremendous popularity in sustainability and energy transitions for its reflexive and evolutionary governance process to transition.[36]

Despite the wide application of MLP and TMF in sustainability transition in developed countries, their application in developing countries is still limited, especially in the context of electricity generation. Batinge[37] argues that a context awareness for designing transitions is pivotal for countries with inadequate electricity as these frameworks were developed in developing countries where there is institutional, infrastructure, and technological maturity compared to developing countries like Nigeria. This study adds to the energy transitions literature by applying MLP and TMF to the Nigerian grid electricity sector. It supports Batinge's[38] arguments that the perceived benefits significantly impact the socio-technical dynamics of new technology as the context of Nigeria is peculiar with energy access and supply challenges. This is different from developed countries where transition is not aimed at augmenting the existing unsustainable and insufficient energy systems but abating the existing infrastructure which is dominated by fossil fuels.

One of the weaknesses of the theories is the absence of transparency and accountability measures which is vital for electricity system transformation as it involves multiple stakeholders with

conflicting interests and thus requires accountability and transparency to ensure effective implementation of grid RE strategies.

In the context of Nigeria, there is a need for integrating RE sources such as wind and solar to the existing fossil-fuel-powered grid. Since there is a need for an optimal energy mix and transformation of social and technical systems, it is important to ensure accountability and transparency in electricity governance. The national grid system, in its current form lacks transparency because of bureaucracy and involvement of multiple stakeholders. Existing studies have found that the policy landscape, governance arrangement and strategic planning process are largely ineffective.

Also, in Nigeria, electricity governance involves integrating RE such as solar and wind, which puts more emphasis on ensuring the accountability and transparency mechanism evolves with the transformation of the social and technical systems. The reason being that the national grid system involves a series of activities with multiple complex actors exceeding the fossil fuel domain, which blurs the accountability and transparency chain. Existing literature has found that the policy landscape, governance arrangement and strategic planning process are ineffective.[39]

This has implications for the strategic planning process and governance of the grid systems for RE development, as shown in this study, and gives rise to questions such as what the level of transparency/accountability in RE development is and who should be accountable for RE, and the role of transparency and mechanism to foster transitions. Hence, this study proposes coupling accountability and transparency concepts into MLP and TMF for strategic planning and governance in energy transition. This study adopts the Bovens[40] definition of accountability and transparency, with the latter referred to as the actors responsible for their actions, agenda and programmes, while the former is the dissemination and access to information.

METHOD

An exploratory qualitative research approach was adopted as it enabled informants to present a rich picture and opinions and determine the challenges of the strategic planning process and governance with insight into the accountability and transparency elements. A mono-method research design supported this approach through a qualitative approach of in-depth semi-structured interviews with 31 experts, executives, and policymakers in Nigeria's energy and non-energy industry.[41] These included public organisations, R&D institutes, associations, climate change movement actors, NGOs, universities, independent researchers, RE investment companies, and businesses and experts' opinions across the electricity value chain. Data were obtained from these multiple perspectives to provide a detailed and holistic view and interpretation of the data, which aligns with cross-sectional research in the domain. A case study grounded in inductive research provided an opportunity to understand the informants' experiences, knowledge, opinion and beliefs. [42]

PARTICIPANTS

The informants were recruited through a purposive sampling technique and a snowballing method was utilised.[43] A research information sheet was provided to participants and a consent form was completed upon acceptance by participants to ensure a valid and reliable process of obtaining consent.[44] The in-depth semi-structured interview was conducted using Teams/Zoom platform due to covid travel restrictions. Participants were recruited remotely and interviewed at a mutually convenient time online through a video and audio medium for 30 to 90 minutes. This occurred between April and December 2021, and a consistent interview protocol was observed for all informants, and participation was voluntary.

DATA COLLECTION AND ANALYSIS

Data collection was concluded at data saturation.[45] The interview was recorded and transcribed. Due to the sensitivity of the research and the high profile of the respondents, the informants were anonymised. The transcribed interviews were analysed through thematic analysis, an inductive approach; themes and patterns were identified.[46] The analysis process was observed following Braun and Clarke's[47] six steps process and supported using NVivo software, enabling a systematic approach to collate, sort and arrange the data. The first step was familiarisation; understanding the data involved a reiterative process of reading the transcript and jotting notes of patterns. The second step was highlighting important and relevant sentences and generating initial codes. The third step involved searching for themes based on the patterns from data collated into groups. And then, the fourth and fifth steps involved reviewing the themes and defining and naming them, respectively. The last step was producing the report.

A SUMMARY OF THE RESEARCH FINDINGS

Findings from the thematic analysis of the interviews of 31 in-depth semi-structured energy and non-energy actors are briefly explained in two sections: the planning process and governance of grid RE transitions, and accountability and transparency in the transition to RE sources of electricity.

TRANSITION PLANNING PROCESS AND GOVERNANCE

Findings show that the planning process faces numerous barriers, such as a lack of a dedicated renewable agency spearheading transition, deep thinking, government commitments and incumbent energy players' buy-in. Furthermore, it was revealed that the transition process started with forming a transition arena. It was discovered that the arena constituted an international and national arena. Some respondents indicated that this included the international community, which influenced the direction of the transition. There also was an inter-ministerial committee and national council at the national level playing an important role in RE policy formation in crafting the vision of transition design centred on a long-term vision to have 30% of a planned 30 gigawatt of electricity from RE sources. However, a few respondents indicated that the international community's involvement in the transition planning process has merits, but it also prevented the proper scoping of the transition problem.

Furthermore, the study found the presence of experiments through the consideration of 14 solar companies, which were aimed at generating electricity for the national grid. However, respondents commented that this had reached a gridlock with no new grid RE technology; some attributed this challenge to the absence of key stakeholders such as the financing agencies and consumers. Also, this finding suggested that the transition process constituted numerous stakeholders such as the government parastatals and agencies, which respondents indicated inhibited the progress. Lastly, it was discovered that no monitoring or review process is in place. However, suggestions were provided that learning from the successful deployment of renewable energy technologies in the off-grid space could serve as a good starting point for the grid space.

ACCOUNTABILITY AND TRANSPARENCY

Accountability and transparency were identified as critical for the success of the transition. However, this needs to be improved in the present grid RE space. The data analysis showed that there were divided opinions; some respondents perceived the level of accountability and transparency as low, with others indicating that relative to other sectors, there is a level of transparency and accountability; however, it needed to be improved. Also, some stated affirmatively that the planning and governance processes are accountable and transparent.

Five key themes emerged from the analysis of suggestions to improve transparency: public information, competitive bidding system, consumer metering, improved leadership, monitoring, and audit. An emphasis was placed on the need to keep the populace abreast of projects and initiatives, and there should be competitive bidding progress for RE projects which is lacking in the sector. Furthermore, respondents suggested that end users' metering should be improved, and regular monitoring and audit of projects and activities should be carried out.

Respondents also identified various roles of transparency in facilitating the on-grid renewable energy deployment process. Five key themes that relate to transparency will lead to a more effective and efficient electricity system; it will promote the knowledge of electricity and foster best practices and acceptance of actual electricity supply costs. Furthermore, it will boost the attractiveness of the sector and investment and growth in renewable energy and, lastly, improve the sector's governance.

Furthermore, findings show that there is no dedicated agency tasked with the responsibility of grid renewable energy initiatives and projects compared to the off-grid space, where there is a dedicated agency called the rural electrification agency, which inhibits accountability. The data analysis shows that the Nigerian Government and ministries, the Nigerian electricity regulatory commission and the energy commission of Nigeria have critical roles to play in ensuring accountability is upheld. Also, findings suggest that all stakeholders in the transition process should be held accountable, and there is a need for a dedicated agency to handle all on-grid renewable energy affairs.

To conclude, when analysing the challenges of the transition planning process and governance, our findings will provide an understanding of what has gone wrong, and the lessons learnt with implications for RE policy and planning.

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A USER'S MANUAL TO THE CITY: TRACES AND ASSEMBLIES OF MONTREAL'S PUBLIC SPACE

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INTRODUCTION

With the recent covid-19 pandemic, physical in-person interaction with municipalities through public equipment has been drastically reduced and at times severed. Given the prevailing situation, there has been a noted acceleration of the "platform state" with increased online migration of public services. This acceleration has had significant effects on the capacity for the city to remain a common thing and, in turn, on the material reality of public space. When its tangible manifestations are reduced and/or replaced by virtual connections, it is the city's own "appearance" that is sacrificed.

This paper presents the results of a research-by-design project on Montréal's public space through its municipal equipment.[1] Started in 2018, the project analyzed spatiotemporal sequences orchestrated at sites where individuals and the municipal administration connect. As discussed here, the interaction framed by these artefacts ranging from objects, to architecture, to networks, is not only productive of public space in its political sense, but participates in the emergence of subjects both individual and collective.

Following a method of "inventory" based on documentation and recombination[2] the studied sites are dissected into parts that are then reassembled into ten architectural ideas. These new assemblies invite critical ways of thinking about the existing city and its public spaces as well as suggests latent capacities of the tangible to be salvaged, recuperated, and re-projected.

USER MANUAL

"Knowledge of the whole and of its laws, of the ensemble and of its structure, could never be deduced from the divided knowledge of its individual components. […] Only the reassembled pieces take on a readable character, take on meaning."[3]

The title of this paper owes to Georges Perec's 1978 *novel La vie mode d'emploi*, translated in English as *Life A User Manual*. The novel is assembled from a series of chapters whose titles refer to rooms and apartments within a Parisian apartment block and whose sequence appears random. Each chapter is an exquisitely detailed description of the occupant and the objects found in each space as well as the stories attached to them. The preamble to the novel, where the above citation is taken, expands on the puzzle as a form and as an analogy. The knowledge of pieces, taken in isolation, does not inform about the whole in which the pieces fit, which can neither be inferred nor deduced from them. It is only when the pieces are put together that they take on meaning.

Whereas in the novel, watercolours are made into puzzles, broken up, and then reassembled, the premise behind our research-by-design project is one of reconfiguration into new arrangements. It observes a condition in detail, breaks it up, and reassembles new conditions from the parts. The result is both of the place (recognizable), and other, and carries meaning for the existing as well as for its potential other states. This is, in fact, analogous to Perec's novel, where its logical structure and chronology are revealed only at the end. The final page of the story is a rough section drawing through the building, revealing, finally, the thing through which all narratives have been channeled. Built form, in the novel, whether building, individual apartment, or object, acts as an anchor for the stories and its characters. The subjects are indissociable from the things they have in common.

PROJECT OVERVIEW

In an analogous way to Perec's novel, our project is interested in those places and moments of the built environment which mediate between the municipal entity – the administrative City – and residents of the city, playing a structuring role in the urban public and political realms as well as processes of subjectivation. We are looking at those in-between places, in other words, where the person appears to the city and the city appears to the person.

Rather than looking at the city's public outdoor areas, parks, streets, or sidewalks — those places officially labelled "public space" — we investigated moments of connection when the municipal apparatus manifests itself and becomes tangible.

The project follows two lines of inquiry. 1) What physical forms do modes of interaction between the city of Montreal and individuals take in the built environment, and how do these manifestations of the urban apparatus frame their mediation? 2) Looking at the design of such municipal mediators in Montreal over the last 25 years, what common aspects across projects of varying categories and scales can be observed?

In approaching these questions through research-by-design, the main objective of the project, beyond documentation and analysis of the existent, is to construct alternative modes of physical interaction with the municipality founded on current material conditions, informing, as it were, potential ontologies of the individual, the collective, and the common.

PUBLIC SPACE

Public spaces are integral and indissociable parts of what constitutes democratically sustainable and liveable cities. Whether they are presented as uncontested or contested, convivial or agonistic, privatized or appropriated, spaces ranging from municipal parks, mixed-use streets, small plazas, interstitial spaces to *terrains vagues* are recognized to play a role in the healthy social life of a city. In Montreal, public spaces, its streets (especially when they are closed to traffic), parks, and open-air plazas have long been pivotal to the city's cultures, social life, and its image, both locally and internationally.

The places and moments we are interested in, however, tend to be spaces that are public to the extent that they create embodied encounters between people outside of their private lives "in public". Encounters that are mediated by municipal equipment. Unlike official public spaces, they tend to be undercelebrated or, given the current state of trust in democratic institutions, diminished and undervalued. Yet, they should deserve closer attention. Taken together, they fall at the intersection of the political, the public, the social, and the private, collapsing them into an event that is constitutive – perhaps even conditional – to being in the city. That is, they are part of the larger urban apparatus, and as such, they participate in the fabrication and evolution of the urban subject, a subjectivation process particular to a given city.

The subject, wrote Giorgio Agamben with respect to the *dispositif*, is that which arises from the "relentless fight between human beings and apparatuses."[4] Interestingly, "fight", in the Italian original text, is "*corpo a corpo*", an expression with a double meaning, here, between combat (closer: hand-to-hand) but also literally *body-to-body*. In other words, the subject arises from the *embodied* encounter between humans and apparatuses. Objects, buildings, partitions, protocols, norms, systems, all regulate the interaction between the person and the municipality and are the means by which the former exists for the latter. From a dialogic perspective, then, neither the person nor the city can be understood outside of the relations that exist between them, mediated by our *dispositifs*.
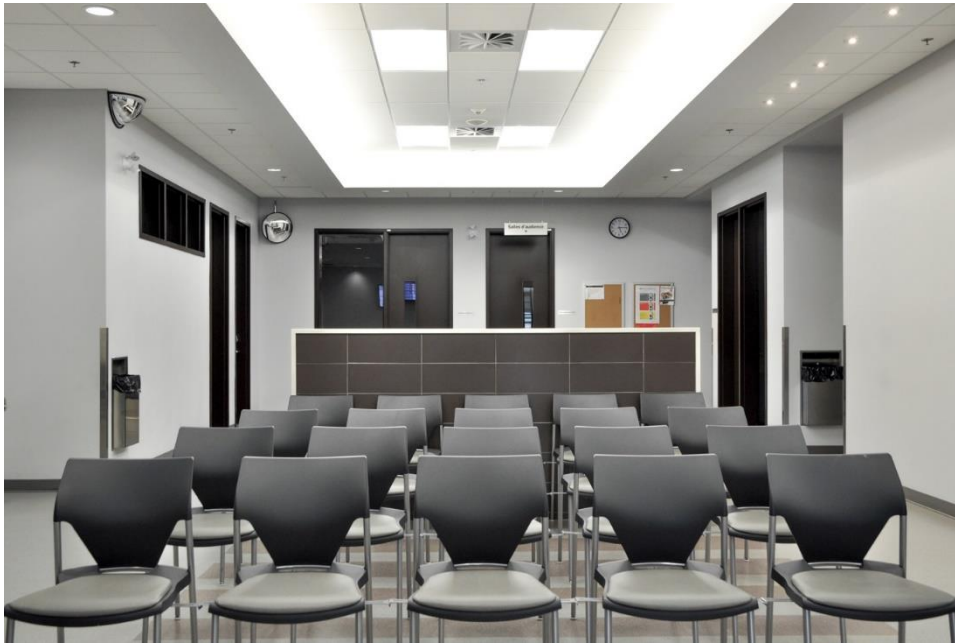
Figure 1. Municipal court south service point

TEN PHYSICAL MANIFESTATIONS OF THE APPARATUS

Ten types of mediators were chosen to start with. Type, in this case, is not tied to the object and its form, but understood by what Kim Dovey and Stephen Wood mean when they write: "[Types are] patterns of repetition of formal configurations incorporating a deeper connection to social and economic functions, while resisting any reduction to either form or function."[5] So, although our chosen physical mediators diverge in function, form, and status, they are all "forms of connectivity" that present "patterns of repetition" within the realm of municipal services. This is a first step in identifying common characteristics and capacities across widely differing events and objects. For example, public to private interface, opening hours, manipulation procedures, queuing systems, etc. The ten types chosen were: municipal court (Figure 1); municipal council meeting room; citizen information office (or Bureau Accès Montréal[6]); refuse and recycling ecocentre; police station; polling station (public school gymnasium); library; cultural centre; bus shelter; and individual recycling bin (Figure 2).

Figure 2. Individual recycling bins at curb on pick-up day. The bin was designed in 2011 by Koen de Winter and André Desrosiers
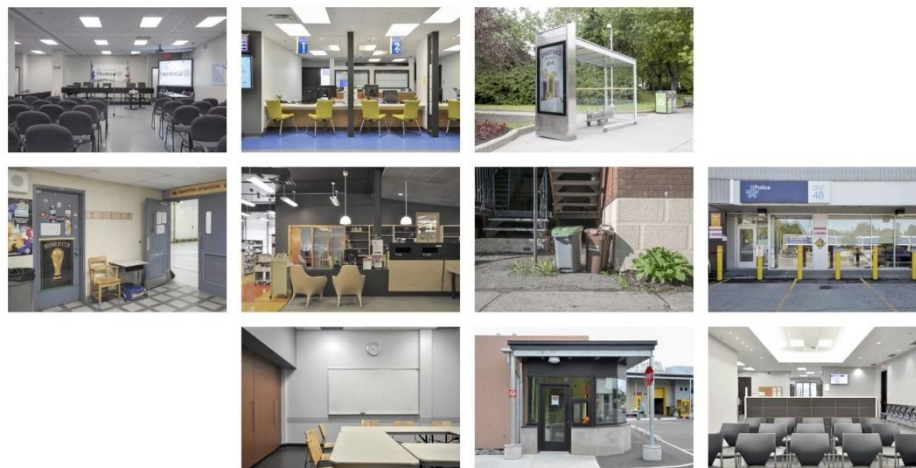
Figure 3. The ten chosen cases, in columns from top to bottom, left to right: council meeting room, polling station, information service point (Bureau accès Montréal), library, cultural centre, bus shelter, recycling bin, ecocentre, police station, municipal court

Our initial repertoire documented all cases of a type across the city. These were mapped, and in the case of municipal council offices, citizen information offices (n=21) and municipal courts (n=6), each instance was photographed. Ten cases were then selected, each representing a type (Figure 3). Each case was documented through photographs and drawings including detailed axonometric drawings at 1:100 scale across all cases, regardless of the size of the object, whether we were drawing a recycling bin in context or a building (Figure 4). Details were drawn to the scale of a leaflet, a keyboard, an automatic door opener. Finally, each case was also documented through text, as a sequence of codes that make up the choreography of interaction.

Figure 4. Bureau accès Montréal, Ahuntsic-Cartierville district, detail of axonometric drawing at 1:100

It is this choreography that "produces" public space. Again, we are speaking of a specific type or dimension of public space. One that is dialogically enacted by the meeting with the municipality and that has more to do with the sustainability of politics and the political-civic realm than the social.
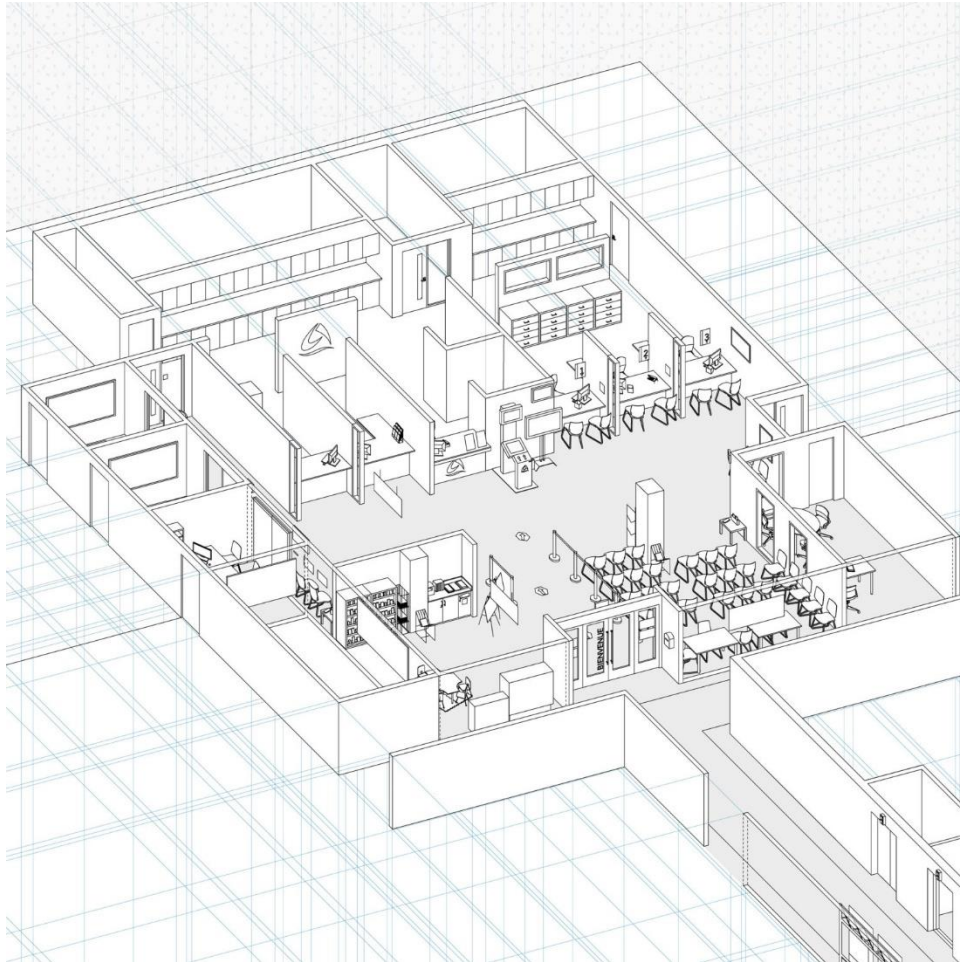
TEN DISSECTIONS OF THE APPARATUS

In studying our ten selected cases as instances of the urban apparatus and as events constitutive of public space, we traced five dimensions across scales — delimitations, time, protocols, connections, and codes — that define the way in which modes of mediation take shape in the built environment. These five dimensions served to dissect each case into elements that could then be grouped without reference to its "parent" type and later reassembled.

The delimitations of the *dispositif* territorialize the municipality so that its policies take shape in space. Lines are drawn, zones defined by borders and thresholds, which in turn affect what is included and excluded, what is made visible, and what remains invisible.

Its temporal elements establish a rhythm of continuities and discontinuities over the course of days, months, seasons, and years. This temporality regulates the public, the presence, and movement of people in distinction to their own biological, domestic, or professional time.

Each *dispositif* has its own protocols that give its prescription and instructions for use, the rules that must be followed for the interaction with the city to take place.

Its connections cut across the urban assemblage and its multiple scales, from the single instance to the wider network, connecting it through infrastructure, services, cables, pipes, and urban flows.

And finally, codes underpin each *dispositif*, from the sequence of inscriptions on the site itself and the discourses attached to it, to the coding and regulations that regulate its form (Figure 5).

Figure 5. Bureau accès Montréal Ahuntsic-Cartierville showing the concomitance of spatial delimitation, protocol, temporal, connection, and code elements

This is where the analysis of the ten individual cases /*dispositifs* stops. To study common capacities between our cases, the *dispositifs* are imagined as separate instances of a city-scale assemblage that has momentarily taken shape. That is, each one is the result of an articulation between parts taken from the same ensemble, each with its own set of relations between delimitations, protocols, connections, codes, and temporalities. Working from the full, complete puzzles, as it were, we work backwards, dissecting each case into its constituent parts: surfaces, partitions, symbols, stairs, mechanisms, screens, schedules, chairs, desks, bins, etc (Figure 6). We extract them from the drawings and the texts and assign them a capacity with regards to our five dimensions.
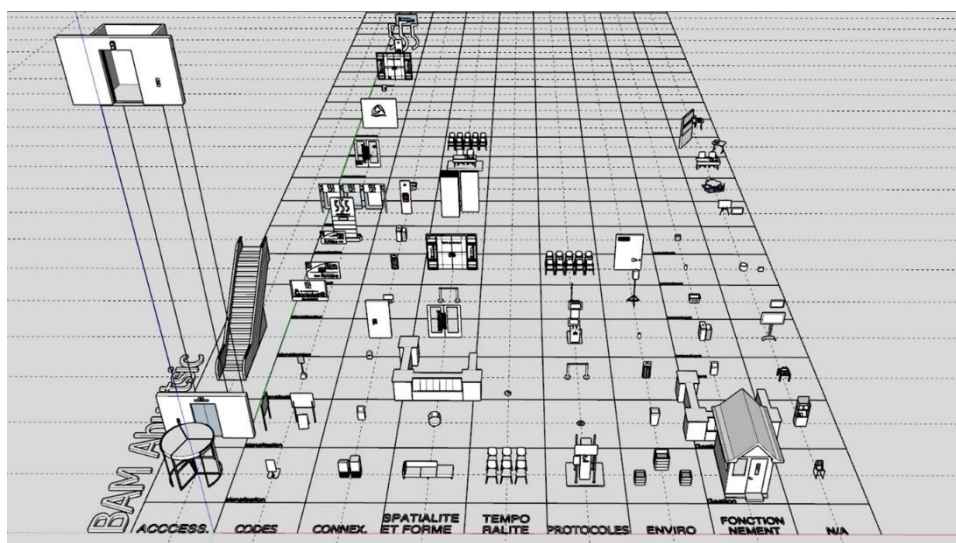

Figure 6. Extraction of elements for the Bureau accès Montréal Ahuntsic-Cartierville

THE TANGIBLE CITY

This project started before the covid-19 pandemic as an investigation into physical connections between city and individuals, following material traces in the midst of a digital metamorphosis of the city. While a critique of the dematerialization of municipal mediation was not the main objective, the events of the past three years and the acceleration of online migration they have caused have raised serious questions about the value of physical mediators.

Digital transactions and mediation have now widely overtaken in-person interaction so that the moments of physical contact with the City are now few and far between. At best it is part of leisurely, cultural activities and at worst an annoyance that forces one back into the subject citizen.[7]

Beyond health and safety concerns in a pandemic context, two of the end goals and justifications for the online migration of municipal services and public mediation are accessibility and increased participation. Yet, as Santini and Carvalho write in a recent review of the literature, the use of online platforms seems to marginally increase participation and further the digital divide.[8] The critique often points out, as a conclusion and way forward, that it is the platforms that should be better used (for their coproduction potential, for example).[9]

On the other hand, Pierre Mazet argues that the move toward the immaterial city is jeopardizing the structuring character (*caractère structurant*) of the physical and embodied encounter with the state or the administration. If, he writes, the "platform state" seems to have practical advantages and to meet the expectations of certain users, it leaves, however, completely unaddressed the effects of the disappearance of the human, embodied dimension of the relationship with the State and public services.[10] While others have reminded us that platforms are still rooted in materiality,[11] most tend to do exactly what Mazet has pointed out and overlook or diminish this symbolic interaction, or the dialogue between person and city. The materiality of the platform is in infrastructure, in the technological landscape of pipes, cables, satellites etc. in other words, a materiality that is at a distance and that eliminates the *corpo-a-corpo* or body-to-body.

The importance of this embodied dimension of city intermediation can be stressed further by asking what other things it carries along as it disappears. The philosopher Hannah Arendt has written about the constitution of a common world. To her, it is appearance, or the moment a thing may be seen and heard (and felt) by others as well as ourselves, that constitutes reality. To live together, she writes, is to say that a world of objects are situated between those that share it or have it in common, as a "table is situated between those who are seated around it", and that this in-between world of objects simultaneously unites and separates individual people.[12] The prerequisite for any public life is therefore a "space of appearance" where people appear, observe, or act in the presence of others and are united and separated by a common world of objects.

The physical *dispositifs* that formalize the presence of the City in urban space act as such in-betweens. With their dematerialization, it is the city's shared space of appearance that is sacrificed. With the devaluation of in-person and physical mediation, we sacrifice material experience and meaning, the embodied experience of the city, to the measure of efficiency: the city becomes a phone number (311), then a website, then data, then a platform. The city, to remain a common world, must remain tangible.

TEN RE-ASSEMBLIES

Our research does not argue that the types studied should be preserved formally, or even functionally, but that they, as an ensemble, gather necessary elements of physical, in-person mediation. Their examination can inform us about present practices and help us anticipate new ones, potentials that may reside in the reassembly of their parts, constructing new modes of mediation between the city and its publics.

In this sense, the ten cases are understood as assemblages. That is, loose configurations of elements that territorialize the municipality and its services into space and time. As Manual DeLanda writes, assemblages are defined by relations of exteriority, as each element can be switched, or taken and plugged-in another assemblage without collapse (as opposed to relations of interiority, where the whole is defined entirely by its parts and the parts by their association to the whole, as in an organism).[13] Having disassembled our ten cases, we reassemble the loose parts according to new valued relationships into new forms of mediation.

Dimension	Field of operation
Delimitations	Political
Protocols	Judiciary
Time	Matter
Connections	Access
Codes	Information

Table 1. Part dimensions and fields of operation

To proceed, we arranged elements according to their principal dimension and their respective field of operation (Table 1). We then combined the fields in pairs and assembled new drawings from the combined elements extracted from the previous drawings (1:100 axonometrics) and a project brief by collaging bits of text from our documentation (Table 2). Both drawing and project brief act together, without one fully representing the other. In this sense, the resulting figures do not represent architecture. They are ideas for modes of municipal mediation that emerge from the assemblage of the current city and a projection of relationships to come.

Combined fields	Project brief
Political + Matter	Material distribution court
Matter + Access	Distributed ledger of temporalities
Matter + Judiciary	Circularity council
Political + Judiciary	Bureau of controversies
Political + Access	Intermodal station for political action
Matter + Information	Treatment centre for immaterials
Political + Information	Theatre of appearance
Information + Judiciary	Central library of user manuals
Information + Access	Institute for vulgarization
Access + Judiciary	Legal aid mobile unit

Table 2. Combined fields of operation and resulting brief

Taking the first four as examples, the following gives a succinct overview of their brief along with the resulting drawing.
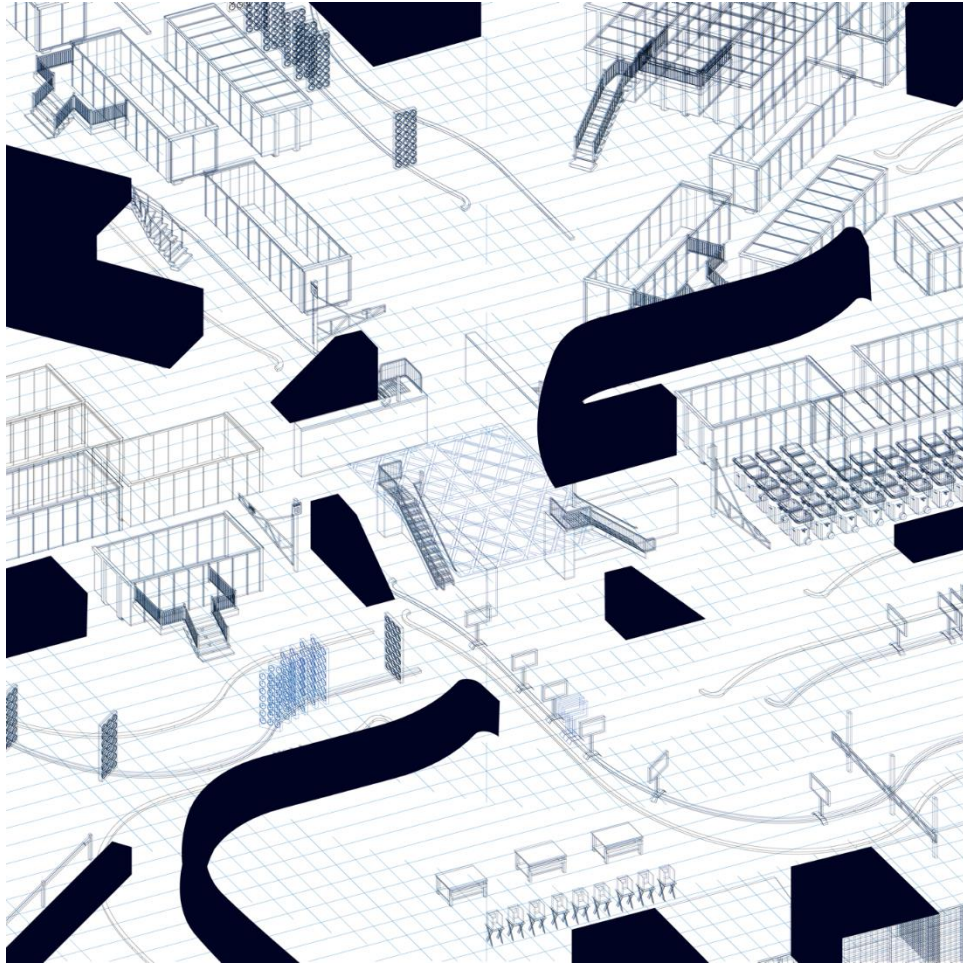
Figure 7. Material distribution court

The Material distribution court's primary concern is the political representation of non-humans (Figure 7). The context of environmental crises is forcing a transformation of political representation in the city. Humans and non-humans occupy an equal place in urban design. The representation of animals, plants, organic and inorganic matter, and objects in the political sphere affirms their agency and confers rights on them according to a new material distribution.
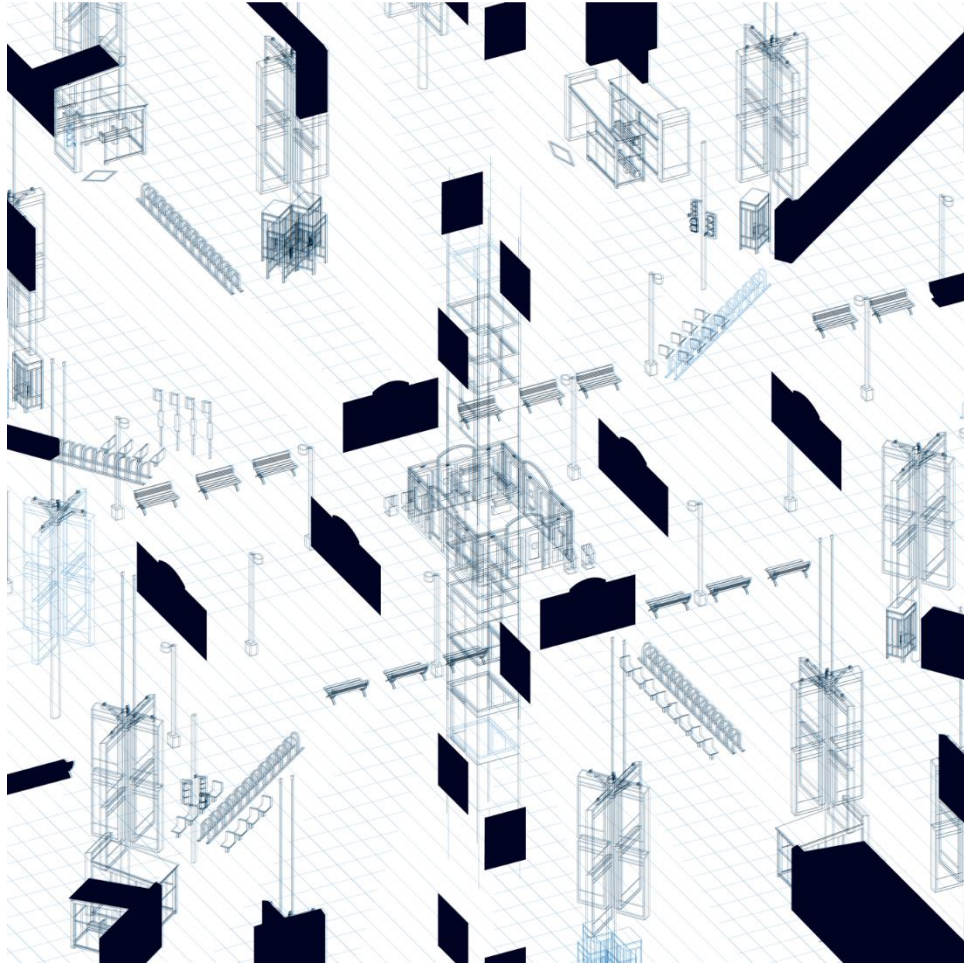
Figure 8. Distributed ledger of temporalities

The Distributed ledger of temporalities is concerned with temporal conflicts in the city (Figure 8). The multiplication and specialization of time in the city is creating more and more temporal gaps and rhythmic incongruities, all of which contribute to growing socio-economic inequalities. The Distributed ledger reconciles, provides access to, and ensures the sharing and exchange of time throughout the city.
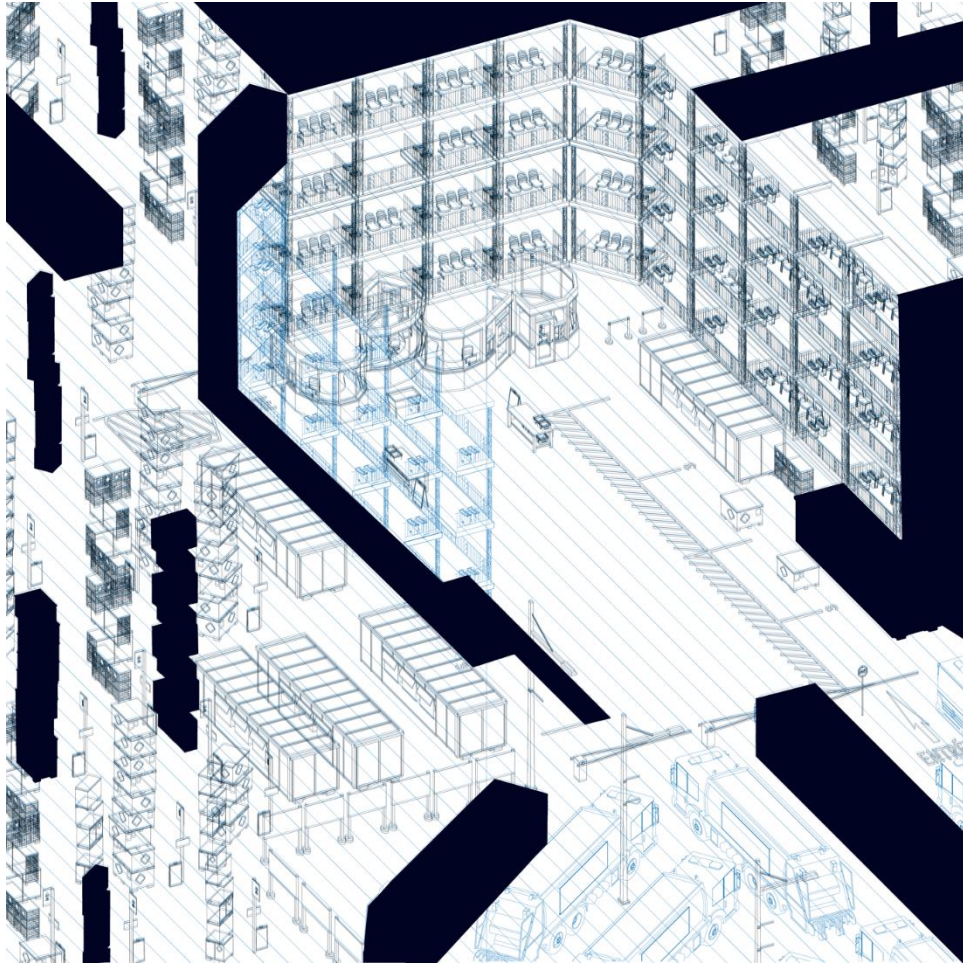
Figure 9. Circularity council

The Circularity council is concerned with issues related to the life cycle and duration of objects and materials (Figure 9). The depletion of resources means that their use and disposal must be controlled and regulated. The Council administers the enforcement of laws on material rights and decides on cases of circulation, recirculation, and end of life.
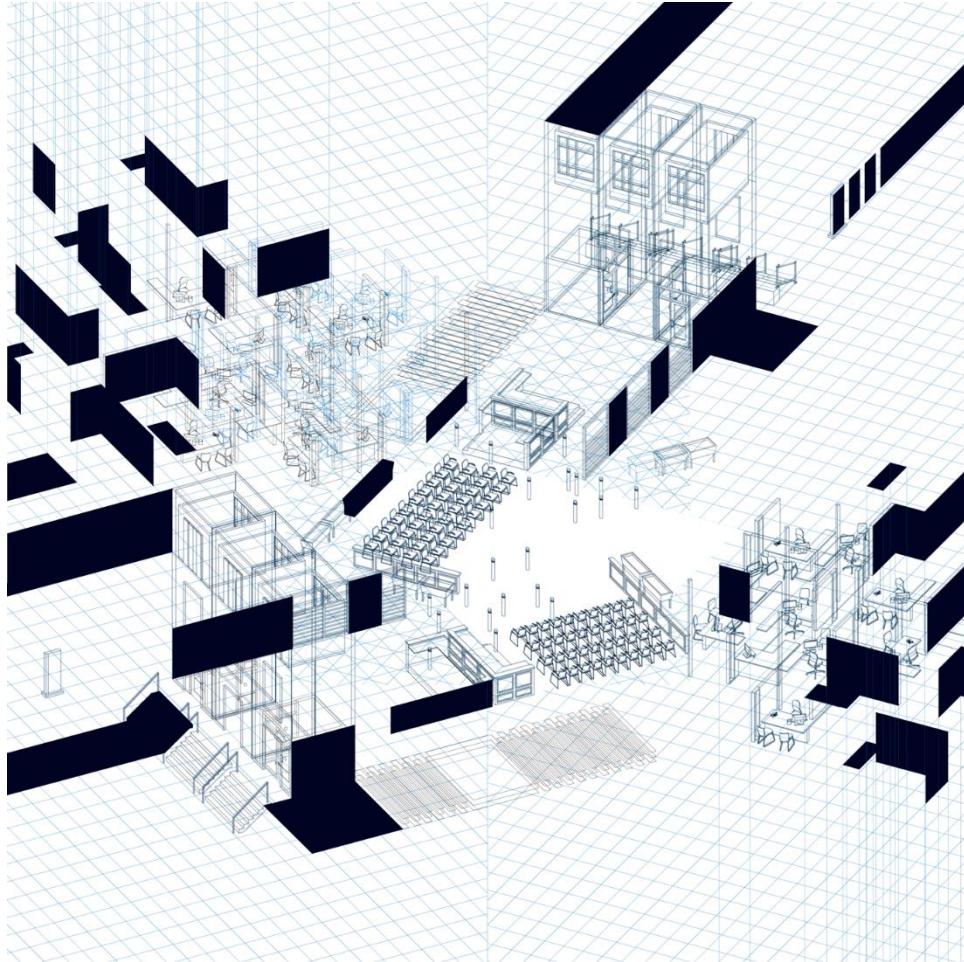
Figure 10. Bureau of controversies

The Bureau of controversies is concerned with the transgression between the legal and political spheres (Figure 10). Its spaces are characterized by two zones that cross each other without needing to meet: one is merely steps to be followed, the other is merely borders. The Bureau receives requests to investigate controversies relating to the non-division of powers and holds public hearings.

CONCLUSION

The whole cannot be understood from individual divided parts, only when the pieces are assembled do they take on meaning. As with Perec's novel, its structure, and the arrangement of its chapters, it is not the final drawing or the brief that make sense in themselves, but their assembly, the dialogue between lines and words, and the retroactive reflection on the state of municipal modes of mediation. They tell, us, in part, what could be salvaged from the field in the midst of an indeterminate and (perhaps) unachievable digital metamorphosis and a tendency toward the dematerialization of municipal encounters. Physical artefacts, in this sense, retain their significance which, at the very least, comes from their capacity and their responsibility to make the workings of the city, its apparatus, tangible. What the exercise of reassembly can tell us is that the given whole — the types that we started with — matter less than the fact that they are assembled from the same ensemble of parts. As they are combined according to new relations, these parts conserve the familiar codes of the actual, existing municipal equipment, but activate them in unexpected ways. Reflecting on the existing, the combined figures show the potential for these *dispositifs* to be activated in ways that go beyond their function and become holds or grips for negotiating new forms of public space. This is

the capacity of the ordinary the project reinforces. All acts of citizenship, form the most banal to the extraordinary, must be celebrated and supported by material arrangements that are fit for what they are and ought to be: conditional to the embodied dimension of being in the city.

NOTES

[1] A preliminary version of this project was presented at Critical Practice in an Age of Complexity, AMPS, Tucson, Arizona, 2018.

[2] Carole Lévesque and Thomas-Bernard Kenniff, eds., *Inventaires / Inventories* (Montréal, QC: École de design; BéPI, 2021).

[3] Georges Perec, *La vie mode d'emploi*, 2nd ed. (Paris: France Loisirs, 1979). Author's translation. The original passage reads: « La connaissance du tout et de ses lois, de l'ensemble et de sa structure, ne saurait être déduite de la connaissance séparée des parties qui le composent… seules les pièces rassemblées prendront un caractère lisible, prendront un sens. »

[4] Giorgio Agamben, "*What Is an Apparatus?" And Other Essays* (Stanford, CA: Stanford U Press, 2009), 14.

[5] Kim Dovey and Stephen Wood, "Public/Private Urban Interfaces: Type, Adaptation, Assemblage", *Journal of Urbanism: International Research on Placemaking and Urban Sustainability* 8, no. 1 (January 2015): 4.

[6] Created in the mid-1980s, the Bureau Accès Montréal are information centres usually attached to the district offices. City employees welcome residents in person for various things including construction permit delivery, recycling and compost bins distribution, parking permit, etc.

[7] In June 2023, Élections Québec, the regulatory body that has the responsibility for elections in the province, announced that it would test an online voting system in the 2025 provincial elections. It has already publicized a call for interest to tech providers for a secure and reliable platform.

[8] Rose Marie Santini and Hanna Carvalho, "The Rise of Participatory Despotism: A Systematic Review of Online Platforms for Political Engagement", *Journal of Information, Communication and Ethics in Society* 17, no. 4 (1 January 2019): 422–37, https://doi.org/10.1108/JICES-02-2019-0016.

[9] Jonathan Davies and Rob Procter, "Online Platforms of Public Participation: A Deliberative Democracy or a Delusion?", in *Proceedings of the 13th International Conference on Theory and Practice of Electronic Governance*, ICEGOV '20 (New York, NY, USA: Association for Computing Machinery, 2020), 746–53, https://doi.org/10.1145/3428502.3428614.

[10] Pierre Mazet, "Vers l'État plateforme", *La Vie des idées*, 2 April 2019, https://laviedesidees.fr/Vers-l-Etat-plateforme.html.

[11] Federico Caprotti, I.-Chun Catherine Chang, and Simon Joss, "Beyond the Smart City: A Typology of Platform Urbanism", *Urban Transformations* 4, no. 1 (26 March 2022): 4, https://doi.org/10.1186/s42854-022-00033-9.

[12] Hannah Arendt, *The Human Condition* (Chicago, IL: University of Chicago Press, 1998), 52.

[13] Manuel DeLanda, *A New Philosophy of Society: Assemblage Theory and Social Complexity* (New York: Continuum International Publishing Group, 2006), 10.

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ARE GATEWAY COMMUNITIES FACING A NEW URBAN APARTHEID?
LESSONS FROM CHELSEA, MASSACHUSETTS

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INTRODUCTION

The Black radical tradition[1] has recently re-energized the urban geography and planning debates, pushing for the study of antiracist and counterhegemonic spatial practices. Along these lines, Roy suggests stepping away from displacement and gentrification jargon and switching attention to processes of dispossession and "racial banishment" as a primary reconceptualization driving relevant ontologies and epistemologies of resistance.[2] This conceptual framework leads to the investigation of how state power and planning practices dispossess and deprive racialized bodies – Black, Brown, and Indigenous individuals – of their place, identity, inner-self feelings, and emotions.

In this paper, we are interested in exploring the effects of planning in the face of intertwined crises: ongoing decision-making processes tackling housing, climate, and pandemic crises. In this realm of planning practice, we concur with the scholars who have stepped away from mainstream conceptualizations of gentrification and displacement. We look at the role of planning (broadly defined) in producing urban change that intentionally or implicitly excludes racialized bodies through the generation of discourse and other tactics. We argue that innovative forms of counter-planning should consider all of the subtle evidence of dispossession manifested in what we define as symbols of exclusion to build credible alternatives for resistance.

BEYOND GENTRIFICATION: PLANNING AS A MECHANISM OF EXCLUSION OF RACIALIZED BODIES

Since the conceptualization of the term gentrification,[3] much scholarship has shown the connection between gentrification phenomena (however defined) and their effects on Black, Indigenous, People of Color (BIPOC) communities. Within this debate, planning scholars have highlighted how gentrification driven by planning initiatives in the face of structural change determines the exclusion of target communities along racial lines.[4] This stream of research parallels old and more recent research that has attempted to go beyond the jargon of gentrification and explore the intentionality of planning to exclude racialized bodies from having access to rights, land, and other resources.

Scholars within the progressive planning tradition have exposed the sinister nature of planning and how planning practice and research could be instrumental in addressing such shortcomings. In the 1960s, Davidoff and Davidoff introduced the term urban apartheid to describe the intentional use of planning law to limit access to certain rights (e.g., the access to new urban opportunities) by people of

color amid suburbanization and the subsequent decay of central cities. "[T]he term 'apartheid,'" they write, "began to be used to describe the de jure, as well as the de facto methods employed to separate rich communities from poor, to protect rich Americans and their children from contact with poor and even middle-class Americans and their children; and to separate black Americans from white Americans.[5]" Years later, Yiftachel used the term apartheid to bolster powerful acts of exclusion committed or exacerbated by government-sanctioned interventions.[6] The term was invoked to go beyond the narrative of marginalization and exclusion and instead make scholarship capable of describing "deeply embedded institutional, material and spatial systems which accord unequal 'packages' of rights and capabilities to the various groups.[7]"

Recent conceptualizations of banishment and apartheid in critical geography provide a closer and more complete view of urban change phenomena, especially in light of contemporary challenges such as climate change, the fight for housing, and the COVID-19 pandemic. Roy recharacterizes the collective movement redefining home and land amid national and international housing crises by considering the history of "banishment" in citymaking.[8] By building on conceptualizations of apartheid and the general injustice over climate-related policies and urban phenomena, Rice and colleagues coined the term "climate apartheid" to indicate all forms of planning or planning-related phenomena determined to face the climate crises which have disruptive effects on BIPOC communities worldwide.[9] As articulated in several different venues, the brunt of those crises has been beared by BIPOC communities, a phenomenon that has accelerated exclusions, with racially variegated planning implications.[10]

CHELSEA (MA): THE TESTING GROUND FOR A COMING APARTHEID?

The City of Chelsea (MA) is one of three cities in the Boston Metro Region (along with Lawrence and Holyoke) that are minority-majority occupied. 65.9% of the Chelsea population is of Latino heritage, primarily Salvadorian, Honduran, and Puerto Rican. Since the 1980s, the city has experienced high levels of corruption in public offices, which led to the city's bankruptcy. Concurrent social tensions due to ethnic conflicts, street crime, and a demoralized police force further destabilized the city.[11] The economic and social upheaval roiling Chelsea reached a head when the municipality was placed into State receivership in 1991. The event prompted the City of Chelsea and its community to engage in the process of re-imagining their future while addressing pervasive conflicts "from below" (at the community level) and "from above" (at the city level). A significant milestone was the ratification of the City Charter in 1993, which occurred through a difficult mediation process that reconciled forces and tensions from "above" and "below" in a novel way.[12] Lessons learned from this pivotal moment – still very recent in Chelsea history – remain at the basis of public life in Chelsea, where non-profit organizations, residents, and city departments try to maintain a constructive dialectical relationship to address citywide issues.

This dialectical relationship between the public and civic society in all its constituencies characterizes a uniquely concerted planning history for Chelsea. In the last two decades, state-city-nonprofit planning efforts have targeted the Chelsea coastline to transition it from an industrial zone to a housing and leisure destination.[13] This rapid and deliberate transformation of the built environment has generated a lot of skepticism among Chelsea's Latino community. Chelsea has long been a gateway community for immigrants fleeing financial hardship and persecution. Immigrants from Central America have had a strong presence in the city since the 2000s, and their population continues to grow due to the strong formal and informal networks of support that exist in Chelsea and the city's Sanctuary City designation.[14]

In the last five years, skepticism of planning initiatives has grown amid worsening housing and climate crises and the COVID-19 pandemic.[15] Such conditions require more scrutiny of neighborhood

and citywide change as experienced by immigrant residents. Between 2020 and 2022, we have conducted research to explore the lived experiences of Chelsea immigrant residents facing a massive transformation of their city. This paper draws from 42 in-depth interviews, community engagement workshops and engaged learning pedagogy experiments designed as part of an ongoing research process in the City of Chelsea to inquire about immigrant communities' perceptions of and ideas for change. By building on previous conceptualizations of banishment and apartheid, we probe the existence of a targeted exclusion of racialized bodies by exploring the opinions about planning-led neighborhood change viewed from the eyes of Chelsea's immigrant residents.

PROBING APARTHEID IN CHELSEA

Amid the threats of racial banishment posed to BIPOC Chelsea residents by both market-driven and state-led change, tangible and perceived indicators of neighborhood apartheid stoke the fears of Chelsea's most vulnerable residents and signify a permitted, racialized assault on their right to remain in the city and thrive. These representations emerged from the findings as symbols. They are iconic, as they cause "a sensory likeness relation [which] is intended or interpreted[16]" among immigrant research participants, a gut reaction of panic, anger, withdrawal, or self-denigration. The symbols we introduce here signify a breakdown of the local community through a dismantling of place, home, social networks, and culture—systems and objects that enabled Chelsea's underserved residents to survive. We call these symbols of exclusion.

Within these symbols of exclusion emerged three types: symbols of everyday life, symbols of the material appearance of things, and perceptual/sensory symbols. Symbols of everyday life include changes to residents' daily routines, which signify an assault on the most basic aspects of their survival: food, health and wellness, education, and safety. Symbols of the material appearance of things are changes in the built environment which they associate with expulsion, encroachment, dismantling, and dispossession. Perceptual/sensory symbols are signifiers that do not directly represent a changing landscape but are secondary associations that generate anxiety and unease. In the following section, we articulate the empirical findings we used to create this typology by accompanying each symbol with one exemplary quote. Although telling, these quotes are limited and therefore do not provide an encompassing view of all residents' perceptions of the effects of planning measures on the intertwined housing, climate, and public health crises.

Symbols of everyday life

Symbols of everyday life include the closure of a grocery store to make way for luxury apartments, de facto segregation at a local playground, and challenges to school registration for young people whose families are not included on the leases of overcrowded apartments. While the city's discourse around housing growth is positive-sum, residents perceive new development as zero-sum because it directly threatens their everyday lives. One resident described the changes as follows:

I've been living in Chelsea for more than 10 years now; when I came, there weren't as many white families like I'm seeing now. So, I can see it's changing a little bit, and that's a little scary for me, because […] when I take my son to Admiral's Hill Park and I see the white parents and the white mother, they don't engage with us. They like isolate themselves. It's kind of sad, because they don't even let their children play with the Latino children. So, it's just very awkward when I go to the park now and it wasn't like that when I came more than ten years ago. […] Something is happening here. I guess Chelsea is getting better, because we have the Silver Line here that is brand new, so it's attracting other types of families. So, what's that going to mean for us[17]?

For this Chelsea mother, new residents—who she felt acted more like bodies in space than neighbors—reflected a changing demographic which compromised her day-to-day routines and

signified looming displacement. Like her, many interviewees shared fears not of the incorporation of white residents into the urban fabric, but of the gradual, trickle-down effect such a demographic shift would have on community norms and on housing costs.

Symbols of the material appearance of things

Symbols of the material appearance of things include physical changes to the urban landscape which suggest a deepening of spatial segregation based on residents' race, ethnicity, family size, and income. These changes represent, for Latinx resident-respondents, their intentional exclusion from decision-making and, therefore, from enjoying the fruits of its outcomes. They manifest as mismatches between new construction or new uses and community needs, which occur on a bedrock of residential segregation and the inequitable distribution of open space and environmental hazards. As the quote below illustrates, even new affordable housing units became symbols of both hope and deception:

My hairdresser, she had this dream that she was going to hit the lottery and get one of the new luxury condos they're building near my house on the Revere line, and that's her dream, and she prays and she says, 'it's just, I feel that God's gonna give me that…' and I say, '[hairdresser's name], I love you, and that's your dream, and that's sacred to you, but you need to know what are your chances…' just like she likes to do her scratch tickets, […] 'when you do your scratch tickets, you want to know your odds? Well, this is kinda like that.' I said, 'let's look at the mathematics of it all. But if this is your dream and God's gonna give it to you I will be real happy. I will make a party for you.' But you see what they're doing to people, they're playing with people's heads.[18]

Chelsea residents reported dire challenges in their search of alternatives to homelessness or intense overcrowding. Some interviewees reported sharing three-bedroom apartments with three other families. For these residents, learning "the odds" brought disappointment where they once saw hope as new residential buildings cropped up throughout the city. Residents 'without papers' felt even more than exclusion; they felt direct threat as private, luxury housing complexes had not in any way been conceived for them. Many interviewees mirror the previous quote by stating how, for Chelsea's most vulnerable renters, even construction with affordable units came to symbolize deception, disappointment, and even peril.

Perceptual/sensory symbols

These include symbols that do not directly relate to real estate or even to changes in the built environment. Instead, they are signifiers that float around residents' daily lives as indicators of encroachment by newcomers and can even pose direct, physical threats to their well-being. These markers cause feelings of anxiety, anger, and unease due to their associations with community harm, fragmentation, and dispossession. They may lack a direct cause or one which cannot be pinpointed. For example, Latinx Chelsea residents who expressed struggling with affording their housing felt sensorily assaulted when they encountered other residents they did not know, particularly those who appeared to be in better financial situations or who seemed to be cultural outsiders. One renter, who grew up in East Boston, believed that the other tenants in his building might have worked at the FBI building recently built in Chelsea because they wore face masks and were not friendly:

I was shocked because I cannot believe the type of people that are my neighbors… I see a lot of people who I can tell […] are out of state, out of the city. […] this building is not with people that you would see in Chelsea. […] You can also tell that [..] by talking to them or even the way they behave. You can tell they're…highly educated, most likely with graduate degrees. You can tell they are professionals and you can tell they're non-Spanish speaking…They come out the building, you can spot them, you can spot them easily, like it's obvious. They're not friendly. They keep to themselves. They often seem suspicious. They, they are anti-social. They are not talkative. […] It's like they're

[saying] why are you here? […] You know what? I think there's something going on here. There's something in people there. There's people moving in the city and they're trying to, trying to, somehow they have an agenda. Someone has an agenda. It's just that things don't happen out of the blue. Something is going on in the city. I can see it in my neighborhood.[19]

This respondent's descriptions of suspicious neighbors reflect the sentiments of other respondents who were skeptical about ongoing change. Without any prior information about the holes in the ground next to their buildings, or the new foundations laid over open space, and without inclusion in a city-led planning process, respondents concluded that an intentional agenda drives urban change. That agenda intends the exclusion of lower-income, Latinx Chelsea residents for the inclusion of more affluent, Boston in-movers. Interviewees felt threatened by their new, more affluent neighbors because they represented a process without a direct cause that sought to eject them from Chelsea. Moreover, they foreshadowed the unraveling of the informal social safety net, which helped residents make rent when they came up short and keep food on their table. In the absence of forms of inclusive planning that can address some of these issues and provide attainable and affordable housing options, lower-income Latinx residents are left feeling like pawns in someone else's game.

CONCLUSION

The array of symbols shown in the empirical section of this paper represents urban phenomena that deserve more scrutiny. We believe that the theoretical framework of racial banishment and apartheid offers an opportunity to reflect on more effective urban planning interventions capable of engaging in complex urban contexts. Refugees and immigrants living in gateway cities like Chelsea are more than temporary residents; they constitute the fabric of urban community life. While this paper focuses on Chelsea, our final reflections may be relevant to other gateway cities undergoing similar planning phenomena, which have catalyzed and been catalyzed by rapid change.

Symbols of everyday life, symbols of the material appearance of things, and perceptual/sensory symbols were conceptualized by analyzing the words shared with us by Chelsea residents. These symbols point to an ongoing transformation of the City of Chelsea that, while conducted under the banner of transparency and participation, overlooks the deep fears of the most underserved residents of the city. Such symbols are, in fact, not necessarily explicit or acknowledged in the public discourse, let alone in official planning processes and outcomes. They are subtle and merit research attention to unpack their origin, existence, and endurance over time in relation to urban policymaking. Mirroring our theoretical framework, we see these symbols as indicators of "creeping apartheid[20]" or "racial banishment,[21]" which need to be brought to the foreground when articulating innovative forms of counter-planning endeavors.

Such endeavors would require new ways to engage racialized bodies in collective actions, counterbalancing mainstream planning practices.[22] This horizon of work challenges the ongoing enthusiasm over academic scholarship aiming to empathetically support existing antiracist social movements. Instead, it suggests that a mutual transformative relation between researchers and racialized bodies should be at the core of any antiracist academic enterprise to build movements toward change. Such a movement would aim at revamping an eclipsed US progressive planning tradition, which has historically combined forms of libertarian pedagogy, social mobilization, and the construction of post-modern epistemologies to shape intentional and collective actions for empowerment.[23]

NOTES

[1] Cedric J. Robinson, *Black Marxism: The Making of the Black Radical Tradition* (Chapel Hill, NC: The University of North Carolina Press, 2000).

[2] Ananya Roy, "Racial Banishment," in *Keywords in Radical Geography: Antipode at 50*, ed. Antipode Editorial Collective et al. (Hoboken, NJ: Wiley, 2019), 229.

[3] Ruth L. Glass, *London: Aspects of Change, Vol. 3* (London: MacGibbon & Kee, 1964).

[4] Lance Freeman, *There Goes the Hood: Views of Gentrification from the Ground Up* (Philadelphia: Temple University Press, 2006).

[5] Paul Davidoff and Linda Davidoff, "Opening the Suburbs: Toward Inclusionary Land Use Controls," Syracuse Law Review 22, no. 2 (1970): 509, doi: 10.2307/213546.

[6] Oren Yiftachel, "Theoretical Notes on 'Gray Cities': The Coming of Urban Apartheid?" Planning Theory 8, no. 1 (2009): 88, doi: 10.1177/1473095208099

[7] Yiftachel, 94.

[8] Ananya Roy, "Dis/Possessive Collectivism: Property and Personhood at City's End," Geoforum 80 (2017): A8, 10.1016/j.geoforum.2016.12.012.

[9] Jennifer R. Rice et al. "Against Climate Apartheid: Confronting the Persistent Legacies of Expendability for Climate Justice," Environment and Planning E: Nature and Space 5, no. 2 (2022): 629, 10.1177/2514848621999286.

[10] See, for instance, the following works: Erin McElroy, "DIS / POSSESSORY DATA POLITICS: From Tenant Screening to Anti-Eviction Organizing," International Journal of Urban and Regional Research 47, no. 1 (2023): 54-70, https://doi.org/10.1111/1468-2427.1315; Ananya Roy, "Emergency Urbanism," in *The Long Year: A 2020 Reader*, ed. Thomas J. Sugrue and Caitlin Zaloom (New York: Columbia University Press, 2022).

[11] Christina Heatherton, "The Broken Windows of Rosa Ramos," in *Feminists Rethink the Neoliberal State*, ed. Leela Fernandes (New York: New York University Press, 2018), 166.

[12] Susan Podziba, "Collaborative Civic Design in Chelsea, Massachusetts," in *Planning in the Face of Conflict: The Surprising Possibilities of Facilitative Leadership,* ed. John Forester (Chicago: American Planning Association, 2013), 177.

[13] Justin B. Hollander and Jessica Soule, "Stakeholder Preferences on a Working Waterfront: Quality of Life, Land Uses and Planning Processes in Chelsea, Massachusetts," in *Handbook of Community Well-Being Research*, ed. Rhonda Phillips and Cecilia Wong (Berlin: Springer, 2017), 340, https://doi.org/10.1007/978-94-024-0878-2_18.

[14] Fabián Torres-Ardila, Daniela Bravo, and Franklin Ortiz, "Increasing Latino Participation Rates in the 2020 Census in Chelsea, MA," (Boston: Gastón Institute Publications, 2020), 2.

[15] Helen V. S. Cole et al. "The COVID-19 Pandemic: Power and Privilege, Gentrification, and Urban Environmental Justice in the Global North," Cities and Health 5, (2021): S72, https://doi.org/10.1080/23748834.2020.1785176

[16] Victor Turner, "Symbolic Studies," Annual Review of Anthropology 4, no. 1 (1975): 152, https://doi.org/10.1146/annurev.an.04.100175.001045.

[17] Interview with key informant #28, Latina mother, Chelsea, MA, September 23, 2022.

[18] Interview with key informant #29, Latina resident, Chelsea, MA, September 24, 2022.

[19] Interview with key informant #20, Latino resident, Chelsea, MA, August 25, 2022.

[20] Oren Yiftachel, "Theoretical Notes on Gray Cities': The Coming of Urban Apartheid?" Planning Theory 8, no. 1 (2009): 88, https://doi.org/10.1177/1473095208099300.

[21] Ananya Roy, "Dis/Possessive Collectivism: Property and Personhood at City's End," Geoforum 80 (2017): A8, https://doi.org/10.1016/j.geoforum.2016.12.012.

[22] Elizabeth L. Sweet and Antonio Raciti, "Planning Theories Struggle at the Intersections of Gendered, Colonized, and Racialized Bodies," Journal of the American Planning Association 88, no. 4 (2022): 584, https://doi.org/10.1080/01944363.2022.2088221.

[23] Kenneth M. Reardon, "Enhancing the Capacity of Community-Based Organizations in East St. Louis," Journal of Planning Education and Research 17 no. 4 (1998): 333, https://doi.org/10.1177/0739456X9801700407.

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EVALUATION OF SELECTED URBAN FORM-RELATED LIVABILITY INDICATORS USING MACHINE LEARNING

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INTRODUCTION

After World War II, the mass production of automobiles in the United States led to the rapid and massive construction of interstate highways, which resulted in the development of extensive cookie-cutter, single-family houses in the far-flung suburbs. The conventional traffic engineering and roadway design level of service standards were developed accordingly to prioritize and accommodate automobiles. However, the mode of transportation paradigm is now changing to prioritize walkability and the use of non-motorized modes of transit. Yet, those irrelevant car-centric levels of service and design standards are still being applied by the conventional traffic engineering field, whereas they should be obsolete.

While there is a dire need to develop new standards, this study developed a benchmarking method that enables planners to identify the closest match from the existing developments to their plan in terms of walkability. Planners can then assess the walkability of their development based on their observation of the closest match before their plan is implemented. Moreover, planners can use the method to conduct "what-if" analyses by changing the walkability-related variables to find a different matched area and improve their plan until they are satisfied with the design. This can help owners and planners make informed decisions about urban form and promote walkable communities. The method applied was by creating an innovative algorithm using k-nearest neighborhood (KNN) machine learning. When applied, the methodology can match the walkability indicators of a proposed Master Plan development with the closest existing development among the 220,740 U.S. Census Block Groups (CBG). The Master Plan can then change the proposed urban form characteristics to match with another CBG to satisfy the client's vision. The selected walkability characteristics are intersection density, proximity to public transit, land use mix, and land use density. Due to the strong correlation between livability and urban form,[1] applying this methodology can help city planners evaluate their plan's pros and cons and guide any required modifications to enhance livability. The KNN machine learning code was created in Python as part of this study.

Problem Statement

The conventional traffic engineering practice prioritizes automobiles and considers roads as conduits to move traffic. Especially after the pandemic, cities value active transportation and have realized that they cannot keep up with building more roads. A transportation network is a framework upon which cities are built. A car-centric city has a different framework and should use different level of service (LOS) and design standards than walkable and transit-oriented cities. Ironically, many cities

considering developing walkable places still use conventional traffic engineering, which will not lead to a vibrant, walkable environment.

Most walkable cities violate conventional traffic engineering standards. This dichotomy requires new LOS and design standards, also a robust benchmarking technique to satisfy the new paradigm. This paper introduces a method to evaluate any urban form by finding its closest match from the existing census block group in the U.S. so that decision-makers can observe the expected results of their intended plans.

Historical Approach

The car-centric approach has exacerbated traffic congestion, space consumption, energy consumption, environmental degradation, traffic accidents, adverse health consequences, and significant expenditures for both the public sector and residents.[2] The cause of such malpractice is historical. In U.S. cities after World War II, the mass production of automobiles led to the rapid and massive construction of interstate highways, which resulted in the development of extensive cookie-cutter, single-family houses in the far-flung suburbs. Such an approach has caused many of the conventional traffic engineering standards and level of service indicators to focus on automobiles and ignore promoting other modes like walking, cycling, and public transit.

From 1950 to 1970, 1.2 million houses were constructed yearly, mostly single-family residential units in the suburbs. The total housing inventory increased by 50% or 21 million units,[3] and 1970 census data revealed that more people were residing in the suburbs than in cities.[4] Expanding low-density developments far from city centers but connected by major highways resulted in car-dependent cities. Since 1970, the number of vehicles in the U.S. has grown at twice the rate of the population. As a result, vehicle miles traveled (VMT) increased by 41%, even though the population has only grown by 4%.[5]

As early as the 1950s, the rise of auto-dependency quickly reduced the use of public transit, and many rail vehicles were destroyed and dumped in junkyards, as shown in Figure 1.[6] The U.S. Highway Act of 1956 authorized the construction of 40,000 miles of interstate highways by 1970, with 90% funded by the federal government. By 1965, 20,000 miles were completed, and while most of the investment occurred outside cities, about 20% of the funds were used in urban settings.[7] By the 1990s, sprawl was an obvious national issue, claiming 2 million acres per year (1.2 million acres of farmland).[8] By 2000, Atlanta, Georgia, had a metropolitan area bigger than the state of Delaware.[9]

Figure 1. Pacific electric cars are piled up awaiting destruction at Terminal Island, 1956.
Source for Image (Wikipedia):
https://en.wikipedia.org/wiki/Pacific_Electric#/media/File:Junked_streetcars.jpg

Car-Centric Conventional Traffic Engineering Standards Examples

Traffic engineering LOS and design standards were developed to support car-centric cities by moving more vehicles faster. However, this was not achieved, and now these standards work against pedestrians and non-motorized transportation modes. Some examples follow.

Volume to Capacity Ratio

Volume-to-capacity ratio (V/C) is a known LOS criterion in conventional traffic engineering which considers that the lower the ratio, the better LOS. This indicator causes the degradation of the urban fabric by encouraging the denominator (capacity) to increase by widening roadways, resulting in an increase of hostile roads, limiting walkability, and discouraging the use of non-motorized modes and public transit.

Fruin's Level of Service

Fruin's method for assessing the pedestrian level of service is sometimes misapplied in conventional traffic engineering.[10] This method was initially intended for crowd management analysis. However, if this tool is misused to assess pedestrian LOS on sidewalks, it will indicate that the fewer pedestrians, the better the LOS, as shown in Figure 2. This would imply that the world's most successful and vibrant pedestrian-friendly streets, which are crowded, have poor LOS at levels E or F and are failing.
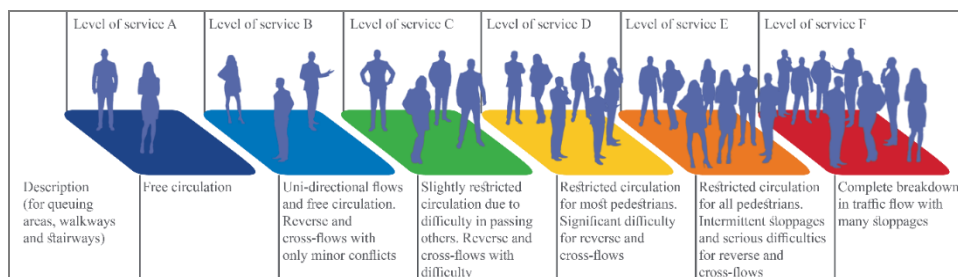
Figure 2. Misusing Fruin's pedestrian level of service standard in conventional traffic engineering can lead to more pedestrians being classified as LOS E and F, which are considered "failing."

Intersection Curb Radii

Typical roadway design standards recommend large curb radii to facilitate easy turns by large vehicles such as trucks, which are just a small fraction of road traffic volume. The large curb radii encourage smaller cars, which comprise most of the traffic, to make turns at high speed, giving drivers less space to react and stop. They are also less likely to yield to pedestrians and cyclists. Large corner radii also make pedestrians cross a longer distance.[11] This increases the risk of crashes, which can be fatal for the non-motorized user.

Weaving, Merge, Diverge Rules

Weaving, merging, and diverging rules instructed by conventional traffic engineering standards require intersections to be spaced far from each other to allow cars to change lanes fast and smoothly. Conversely, a walkable city requires intersections to be spaced closely. Allan Jacobs's monumental study on city street design, which includes data and drawings of more than 40 global cities, each 1-mile square, found that cities with smaller blocks, thus more intersections, are the most walkable.[12] In a different study, Ewing and Cervero (2010) found that increased street intersection density reduces VMT and increases walkability and public transit travel.[13]

Higher intersection density cultivates an interesting walking experience by providing more paths for pedestrians to reach their destination and more places to walk to. The walking experience could be further enhanced if the intersections have well-designed features like trees, benches, and public art. Additionally, more intersections in a given space are considered a traffic calming measure because vehicles move slower, making the streets safer for pedestrians and cyclists.

Dire Need to Create New Traffic Engineering Standards and a Robust Benchmarking Method

Many cities have realized that modes of transportation should prioritize walking, non-motorized, and public transit modes. This approach was further reinforced after the outbreak of the COVID-19 pandemic. People adapted to the restrictions and traveled less. In the U.S. cities, on average, traffic has decreased by 10% from pre-pandemic levels, car ownership has fallen, people have visited brick-and-mortar shops less often, and more people are walking.

Walkability Benefits

Numerous research studies indicate walkability as the key indicator for a livable city. Walkability provides active mobility, warrants consumer cost savings, reduces external costs, decreases emissions, allows efficient land use, improves fitness and public health, and generally enhances community livability.[14]

Figure 3 describes how walkable communities provide economic, social, and environmental benefits, as studied by Todd Litman, leading to public health benefits.

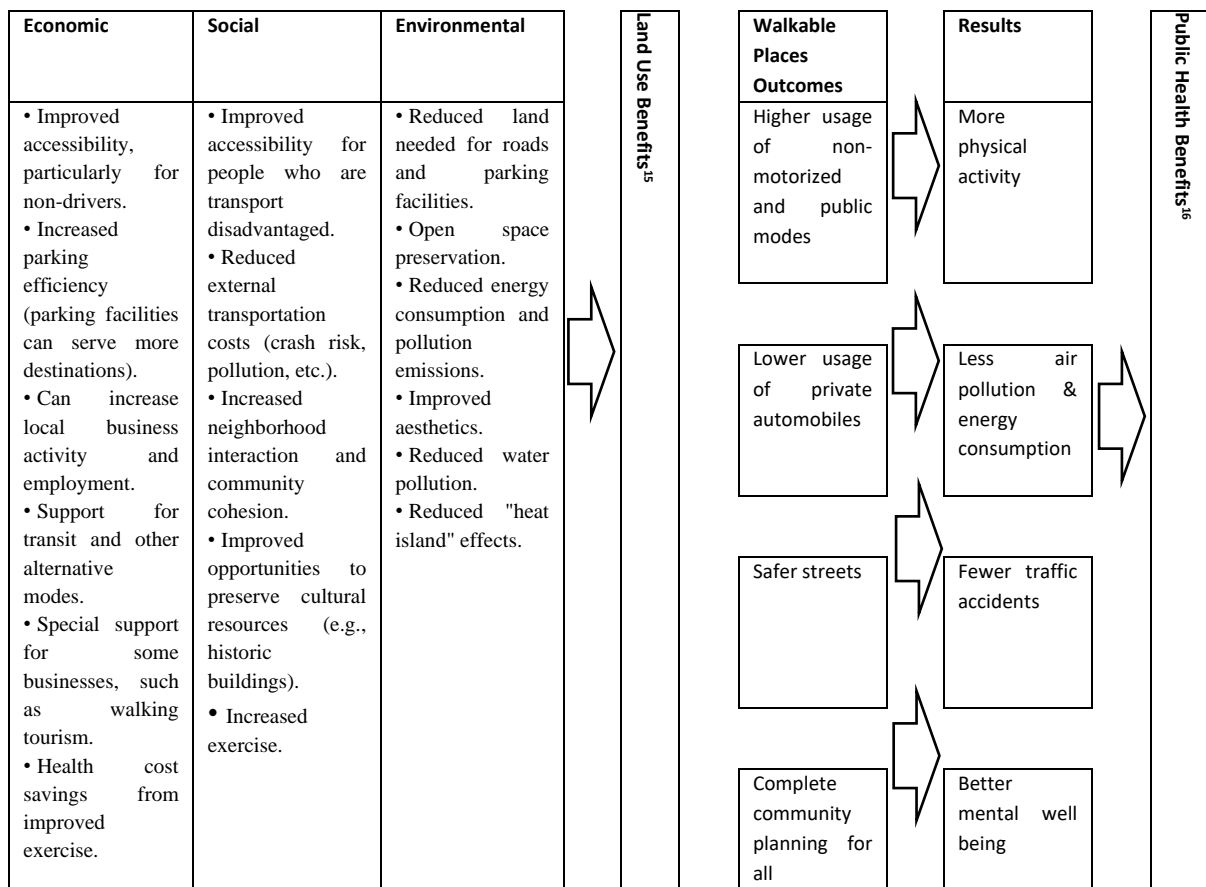| Economic	Social	Environmental	Land Use Benefits[15]	Walkable Places Outcomes	Results	Public Health Benefits[16]
• Improved accessibility, particularly for non-drivers. • Increased parking efficiency (parking facilities can serve more destinations). • Can increase local business activity and employment. • Support for transit and other alternative modes. • Special support for some businesses, such as walking tourism. • Health cost savings from improved exercise.	• Improved accessibility for people who are transport disadvantaged. • Reduced external transportation costs (crash risk, pollution, etc.). • Increased neighborhood interaction and community cohesion. • Improved opportunities to preserve cultural resources (e.g., historic buildings). • Increased exercise.	• Reduced land needed for roads and parking facilities. • Open space preservation. • Reduced energy consumption and pollution emissions. • Improved aesthetics. • Reduced water pollution. • Reduced "heat island" effects.		Higher usage of non-motorized and public modes	More physical activity	
				Lower usage of private automobiles	Less air pollution & energy consumption	
				Safer streets	Fewer traffic accidents	
				Complete community planning for all	Better mental well being	

Figure 3. Walkability benefits

The dire need to prioritize walking and non-motorized modes of transportation, coupled with the absence of a robust benchmarking method and standards for walkable cities, was the impetus to develop a machine learning (ML) technique to evaluate the walkability of any development by comparing it with another existing development among the 220,740 U.S. Census Block Groups (CBG). The ML tool was developed in Python and predicts the closest match for the urban form function related to walkability. Hence, developers can empirically observe how walkable their development will be before built. This method also can be applied to conduct "what-if" analyses, so planners can change the walkability-related variables to find different matched CBGs and improve their plan until they are satisfied with the design.

Methodology

Significant differences exist between walkable and auto-oriented urban fabrics with contradictory standards. The variables affecting walkability could be wide sidewalks, landscaping, street furniture, and climate, but these are not the main cause. There are many nice, wide sidewalks in mild climates but few pedestrians. There are also examples of many pedestrians walking in places with hot and humid weather, like Hong Kong or Singapore, Kuala Lumpur's downtown, or with cold weather, like Manhattan and many European cities.

This study considers the following variables as indicators affecting walkability. These variables, and the formulas applied to calculate them, are the same as those applied by the U.S. Environmental Protection Agency (EPA) Smart Location Database for calculating the National Walkability Index (NWI).[17] In addition, this study applies land use density as a walkability indicator.

Intersection Density – As described earlier, intersection density measures the connectivity of a street network and is a key variable in promoting walkability. A high intersection density means more opportunities to cross streets, making walking from one place to another easier. Intersection density is calculated using the following formula, giving a higher weight to four-legged intersections. Moreover, intersections for auto-oriented facilities are excluded from the calculation.

$$D_n = 0.667 \left(D_{3mm} + D_{3po} \right) + D_{4mm} + D_{4po} \tag{1}$$

Where,

D_n = Intersection density

D_{3mm} = Intersection density in terms of multi-modal having three legs per square mile

D_{3po} = Intersection density in terms of pedestrian-oriented having three legs per square mile

D_{4mm} = Intersection density in terms of multi-modal having four or more legs per square mile

D_{4po} = Intersection density in terms of pedestrian-oriented having four or more legs per square mile

Land Use Mix – Mixed-use developments bring origins closer to destinations, reduce travel distance, promote walkability, and minimize the need for private vehicles. People in mixed-use communities walk or bike more than people in low-density developments with lower connectivity levels and widely separated single land uses for utilitarian purposes[18]. A proxy variable based on employment household mix is used to calculate this variable. The entropy formula is applied as follows.

$$LUM = \frac{-1 \left(\sum_{i=1}^{n} p_i * \ln(p_i) \right)}{\ln(n)} \tag{2}$$

Where,

LUM = Land Use Mix Score

P_i = Number of occupied household/employment by the land use i against the total number of households plus employment

n = Number of activity categories (employment or household)

Proximity to Public Transit – This variable is important for walkable places because at least two legs of any fixed-route, fixed-schedule public transit include walking. This variable is the distance from the centroid of the development to the nearest transit stop in meters.

Land Use Density – High-density developments, with the right population-to-employment ratio, bring origins closer to destinations and make places more walkable. Conversely, mobility in urban sprawl will rely on the use of private automobiles. Studies have shown that people living in more compact areas tend to walk, cycle, and take public transportation, have lower body mass indexes (BMIs), and are less likely to have chronic diseases.[19] People who live in lower-density neighborhoods walk less than people who live in higher-density areas.[20] Land use density in this study is calculated based on two proxy variables, including dividing total employment by area and total household by area. Both areas are in acre units.

Machine Learning, K Nearest Neighborhood (KNN)

The machine learning methodology for this study applied k-nearest neighborhood (KNN), a supervised machine learning algorithm that can be used for classification. It works by finding the k most similar instances in the training data set (220,740 records of Census Block Groups using U.S. Environmental Protection Agency, Smart Location Database) to the new instance (the area to be evaluated) and then using the labels of those k instances (CBG Name) to predict the label of the new instance. As presented below, Euclidean distance is applied to calculate the similarity between the abovementioned variables and the same variables from the training data set.

$$d(p,q)=d(q,p)= \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + \ldots + (q_n - p_n)^2} = \sqrt{\sum_{i=1}^{n}(q_1 - p_i)^2} \qquad (3)$$

Where,

P = Value of the walkability variables described above for the training data set

q = Value of the walkability variables described above for the area being evaluated

The minimum value of the distance identifies the closest CBG match.

Validation

To validate the result, four CBGs in New York City from the training data set were excluded and instead used as an area to be evaluated by finding its closest match. The result was very compelling because the matched CBGs were also identified as four other CBGs, all in New York City, as shown in Figure 4. Following this exercise, the KNN Machine Learning program developed in this study was applied to three different developments in Dubai, and the closest matches among the CBGs in the U.S. related to walkability functions were located.
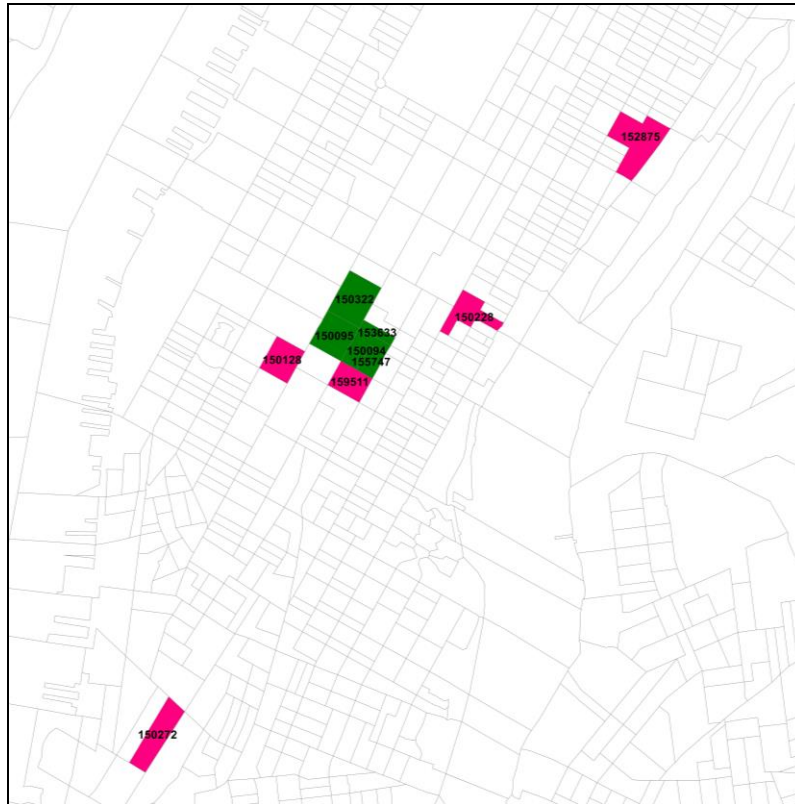
Figure 4. The green areas were excluded from the training data set. Areas in pink were identified as the closest match for walkability characters using the methodology.

CONCLUSION

After World War II, the mass production of automobiles in the United States led to the rapid and massive construction of interstate highways, which resulted in the development of extensive cookie-cutter, single-family houses in the far-flung suburbs, causing cities to become car-centric. Therefore, conventional traffic engineering and roadway design standards were developed to prioritize vehicle movements and use streets as conduits to move traffic. Such transportation networks make cities hostile to walking and the use of non-motorized transportation modes.

However, in the last decade, the mode of transportation paradigm has rapidly changed and accelerated after the COVID-19 pandemic, with a new focus on walkability and other active transportation modes. Traffic engineers should no longer use the same obsolete, car-centric conventional standards for pedestrian-friendly places.

This study developed and validated an innovative methodology that allows planners and developers to observe and visualize how their planned development will function in terms of walkability before it is built. The methodology identifies the closest match to the planned development and uses that match to assess the walkability of the development. The methodology can also be used to evaluate existing sites. Furthermore, planners can conduct "what-if" analyses to see how changes to the site will affect its walkability by identifying different matches. The innovative process identifies the closest match regarding walkability indicators from a training dataset of 220,740 records of Census Block Groups. The indicators used include intersection density, land use mix, proximity to public transit, and land use density. The user can adjust these variables if the closest matched CBG does not conform to the development vision until the right matched CBG is achieved.

To further improve the algorithm applied in this study, researchers should address the issues identified in an article entitled "Identifying appropriate land-use mix measures for use in a national walkability index.[21]" In summary, the article highlights: 1) For the land use mix entropy formula as an example, an area with 50% residential and 50% recreational land use results in the same score as an area with 50% retail and 50% commercial, which should be improved.[22] 2) Even distribution of land use is considered as a better mix in the entropy formula result, whereas there is a lack of theory and evidence around the implicit assumption that even land-use distribution is superior to an uneven distribution for walkability.[23] To make a place more walkable certain population-employment ratio is required to maximize short trips. 3) The entropy measure does not distinguish between contiguous and separate land use juxtapositions. Additionally, a larger training dataset that includes cities in other parts of the world would improve the precision of the predictions.

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TECHNOSCIENCE, "HOMO INNOVANS", EDUCATION, AND THE CULTIVATION OF CRITICAL AND CREATIVE MINDS: A PROPOSAL FOR LEARNING CITIES.[1]

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INTRODUCTION

At the heart of both learning and liveable cities lies the principle of sustainable development. This ethos seamlessly weaves the aspirations of the present generation with the prospects of future ones. Such an intergenerational pledge demands a careful balance between developmental ambitions and the guardianship of our ecology. Within these cities, the integration of economic, social, and environmental goals ensures the promotion of environmentally-friendly practices, a deliberate move to reduce carbon emissions, and a continuous effort to enhance urban biodiversity.[2]

The shift towards a society centered on knowledge has brought to the limelight the essential role of social innovation in the frameworks of learning and liveable cities. Both city types ardently advocate for the birth of solutions that are both creative and practical, designed to address the diverse socio-environmental challenges we face. This innovative environment requires the collaboration of a wide spectrum of social actors, from businesses and non-profit organizations to the general citizenry.[3] Through such synergistic collaborations, cities strive to craft a mosaic of sustainable solutions, directing urban regions from often short-sighted traditional models to more forward-thinking paths.

A foundational tenet intrinsic to both learning cities and liveable cities is participatory governance. Rather than being mere symbolic gestures, civic engagements are actively pursued and cherished in these urban locales. These cities foster spaces that encourage dialogue and interaction, ensuring that residents are not just bystanders but active contributors to the urban development discourse. Policy formulations in these contexts are characterized not by top-down directives but by collaborative efforts, echoing the combined hopes and concerns of the city's inhabitants.[4]

Education is the bedrock on which learning cities are built, viewed as a channel for both individual growth and social transformation. In tandem, liveable cities emphasize the importance of environmental education and awareness of related challenges. The merging of these viewpoints highlights the paramount importance of education, positioning it as the pivotal force driving sustainable progress and nurturing a culture of active civic involvement.

The complex interplay of modern urban dynamics, anchored by knowledge-driven economies, calls for a reevaluation of conventional urban models.[5] Within this nuanced interrelation, although learning cities and liveable cities may differ in their foundational ethos, they emerge as mutually reinforcing concepts. Collectively, they sketch a vision of urban spaces that transcend mere habitability, evolving into thriving centers of knowledge, innovation, and inclusive engagement.[6]

BETWEEN TECHNOSCIENCE AND HUMANISM: AN ANTHROPOLOGICAL REALM FOR INHABITATION IN THE KNOWLEDGE SOCIETY.

The contemporary anthropological discourse has evolved to encompass human nature within the framework of a knowledge-driven society, wherein technoscience assumes a pivotal role. Both technology and science have revolutionized our worldview and reshaped our interactions with the environment and self.

There's a growing acknowledgment of technoscience's profound impact on our perception of human nature. Technological strides have augmented our cognitive, communicative, and physical capacities, affording us unparalleled access to information and knowledge.[7] Yet, these advancements have ushered in ethical conundrums and dilemmas, compelling us to introspect about our intrinsic essence and raison d'être. Within this milieu, the characterization of the human as "homo innovans" emerges.[8]

This notion accentuates that, in the knowledge-centric society, there's a push to revalorize human intelligence and harmonize it with technological and scientific evolution. Mere knowledge acquisition and technological application fall short of actualizing genuine cosmopolitanism and human emancipation. A profound exploration of the confluence between sciences and humanities is imperative to truly fathom human intricacy.

Such an integrative perspective invites contemplation on technoscience's imprint on our notion of human essence. How does technology's ubiquity shape our cognition, relationships, and lifestyles? To what degree does technoscience sculpt our individual and collective identities? What ethical and social repercussions emanate from these breakthroughs? These quintessential queries underscore the pertinence of the "homo innovans" construct in contemporary self-understanding.

"Homo innovans" typifies humans in a society that necessitates rigorous scientific and technological literacy. This literacy entails the honing of abilities to critically appraise scientific and technological trajectories, while cognizing their ethical, social, and political ramifications. The knowledge-oriented society advocates for a discerning and contemplative citizenry adept at engaging in discourses and determinations pertaining to science and technology. Studies in Science, Technology, and Society (STS) can equip individuals with the requisite intellectual arsenal for this analytical literacy.[9]

Modern humanistic endeavors in societies should emphasize social innovation, which revolves around crafting ingenious, sustainable solutions to social and ecological predicaments. While technoscience can be instrumental, it's imperative it be anchored in ethical tenets and democratic ideals. This focus on social innovation posits that scientific and technological advancements ought not to solely chase economic enhancement or technical prowess. Instead, they should cater to the genuine requisites of individuals and communities, fostering a just, egalitarian, and human-rights-respecting civilization. This ethos finds embodiment in the conceptualization of urban landscapes conducive for 21st-century habitation.

Although the knowledge society heralds expansive access to information, it concurrently unveils socio-economic disparities. Equal access to education and growth opportunities remains elusive for many. Thus, knowledge hubs within urban landscapes are of paramount significance. These realms should champion inclusivity, diversity, and civic involvement, and remain universally accessible, irrespective of socio-economic stratifications. By fostering a milieu ripe for perpetual learning and knowledge reciprocity, they lay the groundwork for social innovation and equitable development.

The ethos of lifelong learning is intrinsically aligned with UNESCO's Learning Cities concept.[10] This model contends that educational engagements shouldn't be circumscribed to structured academic timelines but should permeate an individual's lifespan. Learning Cities manifest as sanctuaries facilitating unfettered access to continuous learning, both within formal settings and informal realms.

Lifelong learning underscores that knowledge acquisition isn't confined to conventional academic phases. While formal education instills foundational knowledge, continual learning becomes

imperative in navigating the dynamic social landscape. Lifelong learning empowers individuals to acclimatize to evolving circumstances, refresh their skill sets, and continually expand their intellectual boundaries.

Lifelong learning stands as an inalienable right and responsibility for all, irrespective of age or academic stature. Every individual possesses an irrevocable entitlement to avenues that bolster personal and professional growth.[11] This commitment to unending learning enriches society by fostering civic involvement and honing individual potential.

Lifelong learning is a multifaceted endeavor, spanning varied modes and milieus. While institutionalized education is pivotal, learning also transpires informally within occupational, communal, and quotidian settings. Learning Cities acknowledge and venerate this learning heterogeneity, endorsing policies and stratagems that buttress both formal and informal learning, thereby endorsing a holistic approach to cerebral enhancement.

Learning Cities are envisioned as urban precincts championing lifelong learning and social innovation. Such cities exemplify unwavering dedication to comprehensive human development, creating nurturing ecosystems for lifelong learning.[12] They galvanize communities towards relentless knowledge acquisition, skill development, and professional growth. Furthermore, Learning Cities amplify social innovation by endorsing multidisciplinary collaborations.

Social innovation in Learning Cities is amplified via architectural spaces that intertwine education with social innovation.[13] These spaces materialize as collaborative crucibles where pedagogy and innovation meld to tackle social challenges, spawning innovative and sustainable outcomes. By nurturing symbiotic relationships among educators, researchers, entrepreneurs, and citizens, Learning Cities stimulate ideation and initiatives that augment quality of life and engender equitable social progression.

Learning Cities occupy a pivotal niche in fostering social, economic, and ecological advancements. By championing lifelong learning and social innovation, these urban landscapes enhance the prosperity and well-being of their denizens.[14] On a social front, perpetual learning augments inclusivity and civic participation, thereby weaving a cohesive social fabric. Economically, providing learning opportunities and nurturing innovation stimulates entrepreneurship and job genesis, propelling localized and regional economic buoyancy. Ecologically, by addressing challenges through social innovation, Learning Cities pave the way for a sustainable tomorrow, advocating eco-friendly practices and enhancing community life quality.

In this regard, the urban landscape of the 21st century hinges on striking a harmonious balance between technoscience and humanism. A city striving to embrace an anthropological conception of "homo innovans" becomes more livable and evolves alongside its inhabitants.

Cities evolving in tandem with anthropological perspectives will likely be more resilient and adaptable to future challenges. The knowledge society demands not only the dissemination of information but also its assimilation and application for the common good. Within this context, the confluence of technoscience and humanism in urbanism underscores the role of cities as hubs for learning, innovation, and most crucially, as centers for human connection and growth.

We are perhaps on the cusp of redefining what it means to be urbanized in the knowledge society. Future blueprints should not solely hinge on high-tech solutions but must equally ground themselves in human values, ethics, and collective welfare; it's insufficient for cities to merely be 'smart'; they ought to be humane, inclusive, and adaptive. Thus, the intersection of technoscience and humanism emerges as the central ethos in reshaping the aesthetics and ethos of urban living.

Consequently, Learning Cities, as conceptualized, offer a robust framework to actualize this vision. They emphasize the significance of education, innovation, and collaboration in advancing urban development that is holistic, sustainable, and beneficial for all. Meanwhile, to achieve a world where

cities serve as true bastions of 'livability', a deliberate synthesis of technoscience and humanism is essential. Such cities will not merely be living spaces but also zones of growth, learning, and evolution, crafting an apt environment for innovation and societal collaboration in this knowledge era.

APPLYING INNOVATION IN URBAN PLANNING AND DESIGN: THE EMERGENCE OF THE LEARNING CITY AS A PARADIGM FOR SOCIAL INNOVATION.

In the contemporary urban context, social innovation stands as a vital avenue towards achieving the vision of a thriving, livable city for the 21st century. This vision aligns with the transformation of urban spaces into 'learning cities'. At its core, social innovation emphasizes developing creative and sustainable solutions to social and environmental challenges, while centering the needs and aspirations of communities. While technoscience holds significant potential in aiding this endeavor, it's imperative that it operates under ethical tenets, prioritizing the holistic well-being of humanity—or homo innovans—above mere economic or technical pursuits.[15]

Democracy, as a cornerstone, is increasingly recognized as the most apt governance system for contemporary societies. It offers an institutional scaffolding that encourages citizen engagement and collective decision-making. This ensures that the trajectory and implications of scientific and technological advances undergo democratic scrutiny. Moreover, a democratic ethos nurtures inclusivity and a multiplicity of viewpoints, thereby deterring power monopolies and championing equitable opportunities for all.

As societies further into the knowledge era, the anthropological discourse increasingly intersects with Science and Technology Studies (STS). STS shoulders the duty of cultivating a discerning perspective towards scientific and technological strides, emphasizing a harmonious coexistence between technology and humanity.[16] Embracing democracy and fostering social innovation are indispensable in realizing this vision. A profound, humanistic, and democratic ethos will guarantee that technological advancements uplift homo innovans, laying the groundwork for a just, egalitarian, and rights-respecting society. A pivotal strategy to this end is the championing of lifelong learning and the cultivation of learning cities. These urban hubs can facilitate the dissemination and communal assimilation of knowledge, nurturing an informed citizenry capable of making cities truly livable in the 21st century.[17]

Within this landscape, social innovation, underpinned by the principles of learning cities, emerges as a potent catalyst for social transformation. This paradigm is rooted in the generation of novel ideas, products, or services that comprehensively tackle intricate, enduring social challenges. Through intimate understanding and multi-stakeholder collaboration, social innovation holds promise as an agent of social evolution.[18]

Integral to social innovation is community-driven participation. As social challenges are multifaceted, it's imperative that solutions draw from collective intelligence. This entails synergies between varied entities—enterprises, non-profits, local governance, and most vitally, the communities in focus. Such inclusive endeavors not only ensure contextual relevancy but also enrich solutions through a tapestry of perspectives.

Another quintessential facet of social innovation is its forward-thinking stance. Moving beyond mere reactions to challenges, it advocates for foresighted, proactive interventions.[19] This ethos fosters innovative, scalable, and sustainable solutions that are adept at navigating future complexities, pivoting from a traditionally reactive mindset to proactive change-agency.

However, the knowledge-driven society, despite its promises, can inadvertently amplify existing socio-economic disparities. As knowledge ascends as a pivotal asset, it's crucial to recognize and bridge the educational access chasm.[20] In response, curating urban landscapes around networks of 'knowledge spaces' presents an insightful strategy. These arenas, both tangible and digital, are geared

towards lifelong learning and fostering knowledge symbiosis amongst diverse stakeholders. By amplifying social innovation and fostering participative citizenship, these nodes hold the potential to bridge socio-economic divides and champion equitable growth.[21]

In summation, social innovation pursues holistic, systemic solutions to social issues. Eschewing traditional, siloed approaches, it invites transformative methodologies. By fostering interdisciplinary collaborations, it crafts an ecosystem conducive for pioneering, impactful solutions.[22] And central to this transformative journey is the active involvement of communities, ensuring the solutions resonate with, and are shaped by, those at the heart of the challenges.

CONCLUDING OBSERVATIONS

• Learning cities encapsulate a comprehensive, dynamic model of education, emphasizing the universality of lifelong learning as both a fundamental right and an inherent responsibility of every individual. These urban hubs cultivate varied learning modalities, champion social innovation, and further socio-economic and environmental progression. Through fostering an ambiance conducive to perpetual learning and fostering civic participation, learning cities provide a fertile ground where the capabilities of homo innovans can thrive, leading to the inception of creative and enduring solutions for current and impending challenges.

• Such cities are pivotal in nurturing an innovative ethos, which in turn propels sustainable technological advancements. These urban settings become crucibles for ideation and groundbreaking solutions that respond to modern-day challenges. They facilitate synergetic endeavors between a myriad of stakeholders, including government bodies, commercial sectors, and the broader community.[23] Such collaborations birth initiatives that underscore sustainability and social welfare. The intrinsic innovative ethos within these urban landscapes acts as a transformative agent, endorsing the uptake of eco-friendly technologies, forging sustainable policy frameworks, and pioneering initiatives aimed at elevating the life quality of its denizens.

• Within the framework of learning cities, social innovation stands as a central pillar in orchestrating social evolution. This innovation paradigm, which emphasizes ingenious yet pragmatic solutions, holistic collaboration, and foresight for impending 21st-century challenges, positions itself as an instrumental mechanism for navigating contemporary social intricacies. Moreover, the conceptualization of cities around "knowledge spaces" augments social innovation and civic engagement. This strategy is instrumental in bridging socio-economic disparities, steering communities towards equitable and sustainable growth trajectories.[24] These designated knowledge domains serve as platforms promoting idea exchange, collaborative ventures, and the germination of innovative resolutions to social challenges.

• Social innovation, intertwined with the ethos of learning cities, emerges as a linchpin for social transformation. This perspective, underscored by its pursuit of inventive solutions, multi-stakeholder collaborations, foresight, and the development of knowledge hubs, offers a holistic approach to addressing social challenges.[25] Social innovation prompts a reevaluation of conventional methodologies, urging the adoption of transformative strategies to sculpt more inclusive, engaged, and resilient learning cities.

• A noteworthy characteristic of learning cities is their inherent potential to metamorphose into sustainable urban environments. As prospective sustainable hubs, learning cities are adept at responding to challenges linked with urban resilience, particularly against natural catastrophes or extreme events.[26] These cities emphasize prudent urban planning complemented by robust infrastructure. Moreover, they ensure swift and effective responses during emergencies, factors which are quintessential in the blueprint of a resilient metropolis.

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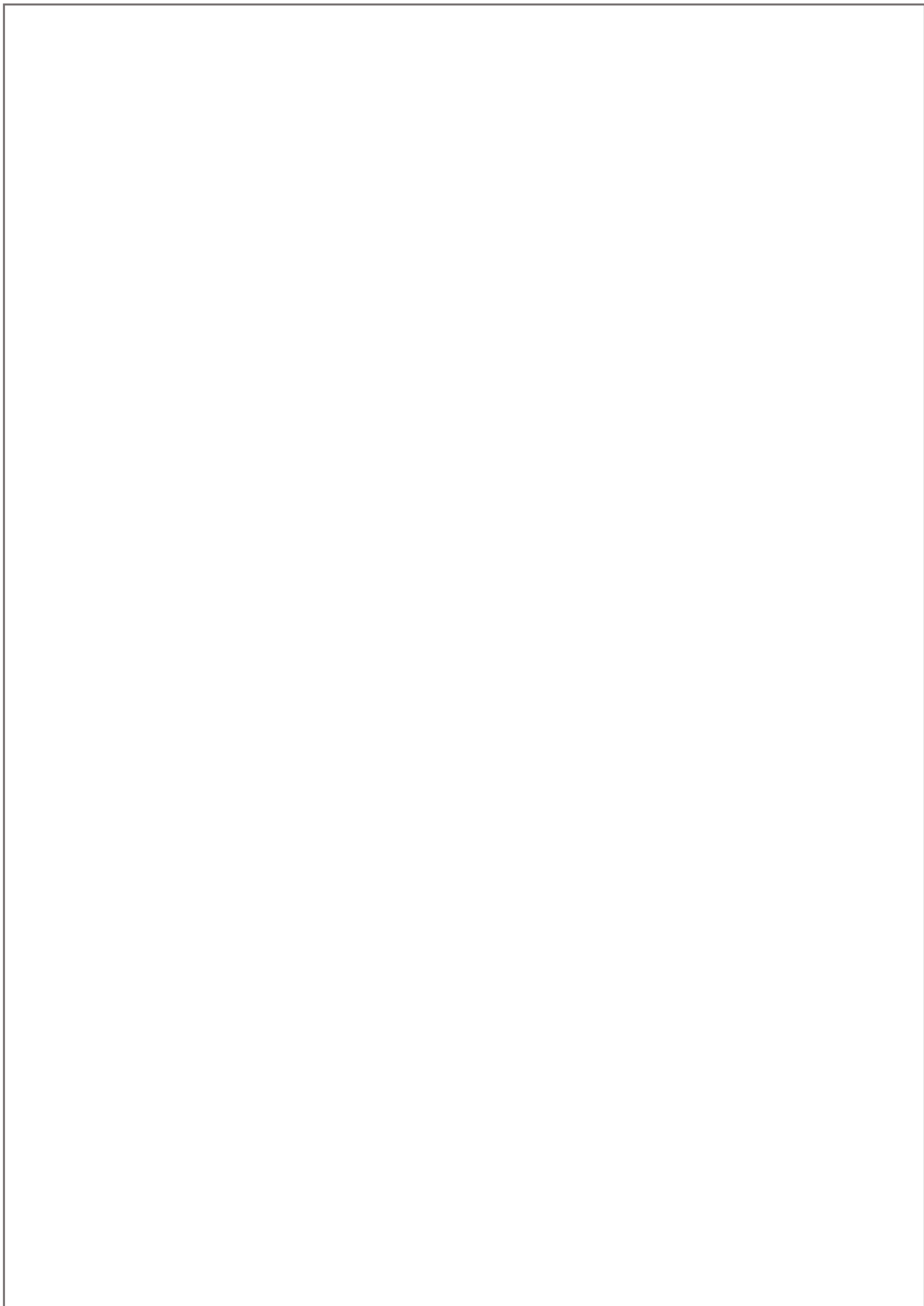
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