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## **OCULUS 2022**

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#### Welcome to this 2022 edition of Oculus!

It is undoubtedly exciting to see this bookazine being packed with a wide variety of insights and perspectives on critical themes affecting our built environment. Oculus offers a terrific representation as to the multidisciplinary nature of research in the Faculty and of the many diverse ways in which our Graduate Research cohort is pushing the boundaries of 'built environment' thinking. We invite you to dive in the following pages immersing yourself in themes as different as the night-time economy, artificial intelligence and the typetion of the house-museum concept, embracing as we do the productive juxtaposition of diverse disciplinary traditions that characterise our work.

Even more importantly, this edition of Oculus presents a vivid testimony of the resilience of our graduate researchers. It comes at what is hopefully the tail end of three dramatic years of a global pandemic that affected not just our daily lives, health, families and wellbeing, but also the way in which we conceive of built environment research in the wake of such a global disruption. In introducing Oculus we cannot but praise the valiant efforts of a brave cohort of emerging scholars that have persevered in their investigations amidst such turbulent times. Embodied in the pages of this volume are not only these changing aspirations but the inventiveness, perseverance and passion for built environment endeavours of this group of scholars and one we commend with our deepest gratitude. Whilst we recognise that a pandemic, superimposed to dramatic climate and socio-economic crises, has been shifting the trajectories of cities and urban issues worldwide, we would also stress that this Oculus collection is a perfect reminder of how this is also a pivotal time for experimenting with modes of urban research, possibilities of innovative built environment methods and recast sensibilities of the likes of architects, designers, planners and more.

We hope you'll enjoy trailing through these pages as much as we did, cheer a big 'congrats' to its editors and authors, and be inspired to engage more with the many voices that make up our amazing graduate cohort.

Happy browsing!

Prof Michele Acuto Associate Dean (Research)

A/Prof Anna Hurlimann Associate Dean (Graduate Research)

#### INTRODUCTION

It is heartening and gives me great pleasure to write the foreword for the Oculus 2022.

The Oculus is a Melbourne School of Design (MSD) Research Students Association (RSA) publication that celebrates a selection of the diverse research undertaken by postgraduate researchers within the Faculty of Architecture, Building and Planning. The publication reflects the outputs of PhD candidates that cross architecture, landscape architecture, urban design, planning and construction.

Following a brief hiatus, in 2021 the RSA Research Committee committed to reinstating the Oculus to showcase the work of MSD Graduate Researchers. I would like to thank everyone who has made the revival of this important publication possible, including each of the contributors who have dedicated time to sharing their research and ideas. I'd also like to pay special thanks to Onur Tumturk (RSA Research Committee 2021), Sombol Mokhles (Research Committee 2022) and Dorsa Kafili (Research Committee 2022), who made the publication possible, volunteering many hours to coordinate the process and design the final output.

Please enjoy, share and discuss this publication – and feel free to reach out to the contributors if you'd like any further information.

Anna Edwards RSA President 2022

# OCULUS PHD Research Projects 2022

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CONSTRUCTION

## THE NIGHT TIME ECONOMY IN AUSTRALIA

Keywords: Night time economy, Australia, Cities

#### Defining the night time economy

The nomenclature surrounding the night time economy is varied, unclear and can be confusing.

It is sometimes referred to as the "evening and night time economy", but others prefer phrases such as "after-dark", "after-hours", "the going out economy" or the "sociable city". Many of these expressions are associated with night time social and entertainment activities, or "nightlife". These core consumption activities (often classified as food, drink and entertainment) are commonly the main focus of night time governance initiatives. Emphasis on these consumption activities, however, can overlook the important work of other night time workers, such as those employed in health care, police, logistics and mining - to name a few. Another important consideration is the distinction between the twentyfour-hour economy and the night time economy. The twentyfour-hour economy refers to the extension of historically daytime activities across the twenty-four-hour cycle. The night time economy, on the other hand, relates only to activity at night. Despite this clear distinction, the two phrases are sometimes used interchangeably.

In addition to complex nomenclature, there is no singular agreed definition of when the night time economy begins and ends. The majority of academic and policy literature tends to use a 6pm to 6am definition (e.g. CCCLM (2021b), GLA Economics (2018), NSW Government (2021)). Some, however, use alternate timings such as 5pm to 5am (e.g. City of Paramatta (2020)) while others cite the hours of darkness. Furthermore, government night time

economy documents often split the night time hours into phases, to help to compartmentalise activities as they change during the night. Again, there is no consistency in these definitions across (and often within) government boundaries.

#### Growing academic and policy interest

Academic interest in the night time economy has increased substantially over the past two to three decades, although it can still be described as a nascent field of study. Academics have highlighted that there is considerably more work to be done to fully understand governance and planning of the city at night. For example, (Acuto, 2019, p. 339) explains that 'scholarship and policy often neglect these dark hours...and there is still too little rigorous evidence to inform policy', while in 2020, a group of eighteen researchers and practitioners stated there is 'a pressing need for interdisciplinary research into the night' (Kyba et al., 2020, p. 2). Alongside academic interest, there has been growing political and government investment in the governance of the urban night, both in Australia and internationally. Recent Australian examples of these include the establishment of the City of Melbourne's Night Time Economy Advisory Committee in 2021 and the publication of the New South Wales Government's 24-Hour Economy Strategy for Sydney in 2020. The COVID-19 pandemic has seemingly sped up and altered the trajectory of night time economy activity and governance. Pandemic measures forced the alteration of business models, while the uprooting of many workers from their city offices to their homes in the suburbs has ignited new debates around urban economics and the utilisation of our cities at night.

Researching the evolution of the night time economy in Australia Despite this rising interest, limited empirical research has been carried out to understand the evolution of the nature and impact of Australian night time economy policies and strategies. There are many factors that will have shaped the contemporary night in Australia, including the underlying social context and historic government policies and initiatives. Many of the influencing factors may not, in the first instance, be considered as having a direct relationship with the night but will have played an important role. These include the proportion of women in the workforce, liquor licensing regulations, trading hours and penalty rates. My PhD thesis will address this literature gap by studying the evolution of Australia's night time economy, with particular focus on how night time labour market and socio-economic trends have evolved over time, and the government initiatives that influenced these.

For the purpose of my research, I will adopt a holistic approach to defining the night time economy; encompassing all economic activity occurring during the hours of 6pm to 6am. Due to the bias of current night time economy initiatives towards these consumption activities, it is likely that my research will be directed towards these activities when reviewing existing policy. I am, however, keen to understand the night time economy more broadly, to better understand economic activity at night and the work that may currently be overlooked.

I believe that my research will be of value in both academic scholarly debate and policy making circles, filling a gap in knowledge that currently exists around the development of the night time economy in Australia and the role of urban governance.



Figure 1: Melbourne after dark. Source: author

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Biography: Anna has been involved in researching and measuring the size of the night time economy in the UK and Australia for more than ten years, most recently through Ingenium Research, which she co-founded in 2017. In 2021, Anna was delighted to be awarded a PhD scholarship to research the topic. Anna holds an MSc in Economic Development Research and, a BA in Business from the and a Specialist Certificate in Leadership.

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## **MIGRAINE AND SPATIAL EXPERIENCE**

Keywords: Architecture, Migraine, Slow Space Movement, Disability Design, Inclusivity

As chronic sufferer's will attest, migraines make fluorescent-lit spaces unbearable and shopping centres excruciating. Staircases may as well be Everest. The repetitive lines of a Venetian blind dissolve into a Bridget Riley painting and they can make you scorn any designer reckoning it '*playful*' to render a building façade with anything resembling her otherwise extraordinary art. Yet, whenever we discuss '*designing for disability*' or '*inclusivity*', scant discourse exists regarding well-known mental health conditions (Aljunaidy & Adi, 2021) let alone a debilitating neurological disposition such as migraine; the world's third most prevalent illness and challenge for more than 10 percent of the global population (MRF)! Part of the reasoning for this is a faint consciousness of neurological experience in architectural design generally. Perhaps more so however, it is about unchallenged assumptions around what makes for universally appreciable spatial qualities.

Migraines themselves are a highly complex neurological disorder typically accompanied by hyper-sensory sensitivity (Zarea et al. 2017). Though usually associated with severe head-pain, they can also manifest as 'silent migraines', whereby there is little to no pain at all. Varying with the individual however, are also many associated and equally debilitating potential symptoms. Of those affecting spatial well-being alone, these can include for example: sensitivities to light, smell and/or sound, visual changes, brainfog, feelings of falling even when seated and vertigo. Given the nature and number of these symptoms, migraine's inclusion into the discourse of spatial environments for many individuals is therefore long overdue. When Anthony Vidler wrote *Warped Space* (2000) for example, it was rightly praised as a profound observation of how architectural space had been critiqued since the simultaneous developments of rapid urban growth in the latter nineteenth-century and the disciplinary emergence of psychoanalysis. This placed particular emphasis on the emergence of phobias such as agoraphobia or claustrophobia. However, an overlooked narrative is that it was a mistaken nineteenth-century supposition and a still too often repeated one, that such conditions attached to urbanism were, or are, typically *'psychological'* and can be remedied as such.

History is filled with under-appreciated instances of creative works influenced by their chronic migraine-suffering authors; the writing Virginia Woolf or the often visceral, other-worldly representations from Monet and Van Gogh for example (Bernstein & McArdle 2008). Likewise, although the connections may have been unclear to physicians at the time, there is strong retrospective evidence suggesting many iconic spatial sequences described in Lewis Carrol's *Alice in Wonderland'* (1865) for example, were also likely inspired by his own migraine aura symptoms (Podoll & Robinson, 1999). Indeed, 'Alice in Wonderland syndrome' has become a catch-all term to describe feelings of sensory distortions that can sometimes occur in the perception of a migraine sufferer's body in space.

The WHO ranks migraine as the eighth most disabling disease worldwide (Urits et al. 2020) with women disproportionately representing an estimated 85 percent of sufferers (MRF). Architectural space alone is certainly not typically discussed as triggering migraine symptoms. Again, causes are countless and for many sufferers it can be difficult enough to merely leave their home. Yet, considering that stress, sunlight or fluorescent lights and loud noise are amongst the most common migraine triggers (Zarea et al. 2017), doing so is only compounded by a hyper-consciousness of what deep down, the human condition with or without migraines knows but is typically forced to overlook. This is that, while some architecture and urban spaces can offer feelings of comfort and kindness, most simply amplify the worst of the stresses and over-saturation we are all already feeling (TSL, 2021).

Architecture is a discipline proudly devoted to a noble premise

of 'designing great spaces'. For who might be cryptic enough. Often however, the chant is translated into gestures towards a hyper-stimulating materialism hell-bent on 'activating the space' or serving a narrative offering to the ill-understood Bachelard before endowing the mortal public with benevolence. Sometimes this attitude produces astounding spaces. Mostly though, for architecture to be more broadly responsive to neurological dispositions and subsequent disabilities, then 'spatial activation' needs to be more critically deliberated as predetermining 'great spaces'. After all, even the intricately patterned surfaces of the Alhambra Palace have places for the eyes and body to rest (Henderson, 2019).

In the short-term, initiatives such as 'low-sensory shopping hours' that some supermarkets have instigated are welcome. These typically reduce or eliminate background music and checkout noises, soften lighting and reduce trolley collection. Longer term, a more prevalent approach certainly does not imply all architecture needs to be intrinsically 'bland' but it does call for a more sensitive mode of critical design thinking – the sort that the 'Slow Space Movement' or say, BLOXAS have been developing. This emphasises the likes of labour conditions, materiality, tone, texture, walkability and even acoustic qualities of space through a cognitive lens more focussed on human sensitivity than the status quo. Consequently, it may be that architectural and urban space can be a little more like our best friends – the sorts of people we want to spend time with and find comfort in (TSL, 2021).

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Figure 1. House for CFS Sufferer, Taylor by BLOXAS



Figure 2. House for CFS Sufferer Taylor by BLOXAS



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## **ARCHITECTURE IN PLAY**

Keywords: Architecture; Videogame Design; Virtual Spaces

The proliferation of new technologies and software products has led to radical changes in the traditional modes and techniques of architectural media, representation and visualisation. Since the second half of the 20th-century, the process of architectural design keenly adopted the digital tools and technologies and was further reformed by them. In recent years, and in parallel with advancements in the digital technologies, the practice and theory of architecture started to share common areas with other disciplines such as cinema and videogames. Real architectural spaces and the virtual spaces of videogames have commonalities in terms of form, geometry, projection, imagination, design processes and narrative gualities. The purpose of this research is to investigate the shared realm, to compare, and to make a bridge between the newly emerged field of videogame studies and architecture through a multidisciplinary perspective. This research will focus on the representation of architecture and urbanism in videogame spaces where the players experience, explore, inhabit and manipulate the constructed worlds but architecture is not physically present.

To enhance the interactivity and immersion of video game environments, the game developers either simulate or alter the real-world rules and logics in their level designs to create eccentric, peculiar and imaginative settings. Henry Jenkins highlights that 'game designers don't simply tell stories; they design worlds and sculpt spaces' (Jenkins, 2003: 121). Digitally crafted images in videogames, design and construct virtual environments and animate and narrate them. At the most basic level videogame design and architecture share their most fundamental aspects: designing, planning, strategy, form generation, textures, materiality and working on scale. These aspects, are not purely digital attributes, rather, they require an in-depth comprehension of architectural techniques and methods. By considering videogames as both rule-based systems and a medium with spatial characteristics this study examines how the visual image, spatial characteristics and architectural properties operate in game worlds.

This PhD research explores game spaces by conducting a multidisciplinary research approach to scrutinise the reciprocal relationships between spatial principles of videogame environments and architecture. It explores the shared ground between videogame design and the field of architecture through several themes and topics that question and investigate the architectural and urban frameworks of the virtual game worlds including visual projection, narrative, atmosphere, interactivity, and the notion of 'rule-making and rule-breaking'. This reciprocity introduces a new field of study in academic education of architecture by improving the common design process through a multidisciplinary perspective.



Figure 1. Travis Scott's concert on Fortnite watched by over 12 million players, Epic Games, April 2020





Orthographic Projection

Axonometric Projection

Third-Person View





Over-The-Shoulder View

Figure 2. visual projections and camera angels for immersion, made by the author.



DORSA KAFILI PhD Candidate, The University of Melbourne

Dorsa is an architect, researcher and amateur gamer with a passion for world-building and visual storytelling in videogames media. Her work sits between disciplines of architecture and game studies and brings in a lot of background on theoretical dimensions of how research is conducted in these disciplines. Email: kafilid@student.unimelb.edu.au

Field: Architecture

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## EXPERTISE, PLAYFULNESS, AND ANALOGICAL REASONING: THREE STRATEGIES TO TRAIN ARTI-FICIAL INTELLIGENCE FOR DESIGN APPLICATIONS

Keywords: Artificial Intelligence, CAD Research, Design Cognition, Generative Models, Reinforcement Learning

#### Introduction

Since the 1960s, computational tools have been developed and applied in design to automate such tasks as drafting, analysis, and optimisation. In terms of human-machine interaction, these tools passively respond to the instructions provided by the designer. Computational tools have a limited capacity to inform conceptual design and idea generation commands are known, and the output is therefore largely predictable.

A new form of computation based on AI has recently been proposed. AI models can learn instructions on their own and only require input in the form of a dataset and a learning objective. The functioning of these models is mostly hidden, and therefore the output of human-machine interaction is less predictable. This research work leverages this characteristic of AI to develop computational tools. Such tools can autonomously learn design strategies and interact with the designer to suggest design options that are unbiased by formal descriptions of the design problem. The aims of this research are: (1) implementing different strategies to train AI models in architectural and structural design, and (2) developing AI-based computational tools that allow new forms of human-machine interaction in Computer Aided Design.

#### Three learning mechanisms

Learning how to design is a daunting task for humans, let alone machines. Designing involves the mastery of technical skills and

the proficient use of imagination and creativity, which requires the designer to make good use of both specialist and general knowledge.

In this PhD, it is assumed that the acquisition of design knowledge happens through three distinct learning mechanisms: expertise, playfulness, and analogical reasoning. In design education, expertise is related to studying and analysing design precedents, while playfulness is linked to model making, and analogical reasoning pertains to finding inspiration in domains other than architecture, such as nature, art, music, and literature. Training AI in design should therefore attempt to simulate these mechanisms.

Through a set of applications, the research demonstrates how AI models can be trained in design by simulating these mechanisms and how the trained AI models can be interfaced with CAD software and interact with humans to support conceptual design and idea generation (Mirra and Pugnale, 2022a).

#### Expertise

Al models that acquire knowledge by simulating a learning mechanism based on expertise are trained on datasets of design precedents. The trained AI models are deployed as design tools that support design exploration by means of sketches. The interaction with the AI-based design tool happens through a visual interface whereby the designer communicates by sketching and the tool responds by interpreting the sketch, producing a different representation. Interaction with the tool does not end after a first iteration. Instead, the designer is encouraged to adjust the initial sketch – or even make new sketches – for several times to explore different elaborations of the same idea with the aid of the machine's feedback.

'Sketches Of Thought' (Mirra, 2020) is a design tool that allows exploring multiple instantiations of a design idea through sketching. At the core of the tool, there is an AI model that acquires knowledge from a dataset of pictures of architectural and structural designs and learns to reuse such knowledge to translate hand-drawn sketches into new photorealistic architectural images (Figure 1).

An analogous tool was developed to support the conceptual



*Figure 1. Graphic User Interface developed to interact with an AI model that translates hand-drawn sketches into architectural pictures.* 

design of large span structures (Mirra and Pugnale, 2022b). The AI model was trained on a dataset of 40 well-known design precedents of shell and structures to construct a design space. Unlike the current approaches to parametric design and optimisation, the design space exploration does not occur via design variables, but through a visual input, which corresponds to a sketch of a design footprint. A design suggestion can be inferred from the AI-generated architectural forms by analysing such features as the location and extension of the support edges, the shape of the openings, or the curvature inversions (Figure 2). Apart from sketch-driven design exploration, AI models trained on expertise can also be used to construct large design space for conventional optimisation applications, therefore opening new possibilities within the realm of already established computational techniques and approaches (Mirra and Pugnale, 2021).



Figure 2. Application of an AI model trained on a dataset of 40 shells and structures. On the left, 2D footprints defined by the designer. On the right, 3D forms generated by the AI model through multiple interpretations of the input footprints.

#### Playfulness

Al models that acquire knowledge by simulating playfulness do not rely on existing datasets. Instead, these models learn to develop 'design strategies' from the exploration of an environment. The AI models explore the environment via trial and error by performing an action and observing the effects of such an action. The driver of an action is the achievement of a design goal. These models learn by reinforcement, that is, by reproducing more frequently those actions that lead to a design outcome that satisfies the goal.





Figure 3. Functional diagram showing how an AI agent interacts with a 3D modelling environment to design a structurally sound form.

Figure 3 shows how an AI model can be trained via Reinforcement Learning to generate a structural form. The agent can place 3D blocks in any position to receive feedback from the environment about the structural feasibility of a designed structure. Once trained, the model can be used to interpret any partially defined input configuration of blocks and complete it by adding extra blocks. The resulting form will be the best attempt made by the model to achieve the design goal starting from the input configuration defined by the designer, thus providing valuable suggestions on how to develop an idea further.

#### **Analogical Reasoning**

Al models that acquire knowledge by simulating analogical reasoning also engage in a process of free exploration. However, rather than being performance-driven, this process maximises the visual similarity between generated forms and forms from a different domain, such as nature. The Al model constructs analogies by mapping visual information from the source domain – nature – to the target domain – design. This happens via a process of visual abstraction, i.e. by first extracting a minimum set of features from the source domain and then reproducing such features to generate an architectural/structural form. The application described in Mirra et al. (2022) tested the ability of Al to acquire knowledge from a dataset of tree forms and syn-

thesise visual abstractions of such forms. The forms synthesised by the AI model can be used to inform the design of easy to build and scalable human-made replacements of tree structures for deforested areas. Analogical reasoning was simulated by specifying a set of design constraints, such as the number of 3D modelling actions. The AI model was able to successfully reproduce the main features of the tree forms, such as the branching patterns and trunk-canopy articulations, even for a limited provision of only 10 modelling actions.

#### Conclusion

The AI-based computational design tools developed as part of this PhD are meant to support design exploration. The designer can decide to use the outputs obtained through the interaction with these tools to inform the next stages of the design process, including problem-framing and decision making. Although no tool is guaranteed to expand the designer's creativity or automatically lead to outstanding design solutions, AI models reveal a certain degree of autonomy and thus have a higher potential, compared to other computational techniques, to support conceptual design at a deep level.

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## THE LIMITS OF ARCHITECTURAL REPRESENTATION

Keywords: Architecture, Representation, Atmospheres, Architectural Pedagogy.

#### **Conventional Architectural Representations**

Since the early adoption of mathematical drawings in architecture, design practices have been based on abstract concepts, such as orthography, axonometry or planimetric drawing, as means to anticipate the exact correspondence between ideas and the built environment (Pérez-Gómez, 2016). These modern representation paradigms (Corner, 1999) are rational ideas that have been defined in an almost endogamous way through codes, techniques and tools that come from the discipline. Therefore, the information they communicate comes only from aspects of reality that are accessible through these same codes, techniques and tools. These are the spatiality of a place, the rhythms of its components, proportions or its tectonic expression.

Planimetric drawings, perspective views or models aim to clarify reality and represent it as something immediately reachable and unambiguous. "They are expected to be absolutely unambiguous to avoid possible (mis)interpretations, and to function as efficient neutral instruments devoid of inherent value other than their capacity for accurate transcription" (Pérez-Gómez, 2007: 12). Even after a project is already built, conventional architecture photography seeks clarity and precision (Böhme, 2017) and stresses the building as an object, well defined and with an easy-to-grasp character.

Architectural drawings are non-temporal and non-spatial (Migayrou, Frampton & Holl, 1998). A plan presents spaces as a totality. There is no doubt there, nor a sense of discovery. Any architectural space, as simple as it can be, implies a certain mystery and it is only revealed by motion and time. An axonometric drawing explains a building as a volume at a distance —normally from a creator's point of view. An architectural space becomes an object to be touched, whilst in reality, they are the ones that touch us. Being in an architectural space is an enveloping experience, unfocused, peripheral and affective. Even when we do not realise the effects they have over us.

This condition is relevant, as most of the knowledge that we acquire from the study of other works of architecture comes from these kinds of representation which, incidentally, lack the means to communicate their more open atmospheric qualities. After all, it is unusual to be able to travel the world to get a first-person impression of the projects we study from publications. There, as Gadamer argues, representations are not just a substitute for something else, nor do they enjoy a less authentic existence. Far from that, what is represented is present in them and in the only possible way (1986, p. 35). The representation of architecture assumes the absence of the real place and underlines the value of the representation itself.

So, whether through photographs, drawings or even their descriptions, these interpretations condition the way of understanding a work of architecture. Then, if through these representations only the formal properties of a place are communicated, then those elements will naturally be read as the dominant — if not the only— components of this architecture. Conventional architectural representations are useful for accurately recognizing the number of rooms or the precise measurements of an architectural space, but they offer little means of conveying other more ambiguous qualities, such as the scale of a place, its material expression, the colour and movement of light in it, its soundscape or the complete and simultaneous presence of all things and people in space. These are some qualities or phenomena "that cannot be represented directly and yet constitute the very essence of any particular space" (Vesely, 2004: 44).

Now, if the creation of architecture depends on the possibilities of representation; and if these qualities that cannot be portrayed are "the very essence" architectural spaces, then conventional architectural representation is falling short to portray the core of architecture work and more importantly, is narrowing the possibilities for the creation of new ones. Thus, there is a reason to pursue this task. However, if representations are rational, analytical and determinative acts, how could they convey qualities that are experienced in a perceptive, all-encompassing and vague manner?

To address the question, we have to interrogate the aims and objectives of architectural representation. Conventional architectural representation aims to clarify reality and to determine it as an entity at our service. It highlights a relationship of ordering and mastering (Bolt, 2014) with our environment that we do not possess in real life. If architecture is to offer, not only 'not only stories and philosophical utopias but "lived experiences" (Griffero, 2016), then the primary goal of representation should not be to control reality but to enhance our ability to in it. Now, as the core of architecture works relies on undeterminable conditions, it seems counterintuitive to their representations aim to make them something determined.

If we question the aims and objectives of architectural representation, then the absolute precision on portraying reality becomes a restriction as it steers the viewers and steals the scope of play and interpretation from their imagination (Ullrich, 2002, p.18). On the contrary, the seek for representations with an intentionally undetermined character is a provocation. A trigger of associations that are rooted in real-life experiences and that welcomes the involvement of their beholders (Smid, 2012). Under this perspective, an architectural representation then should embrace the vague, enigmatic and suggestive character of real-life spaces, instead of trying to determine it.

#### Atmospheric methods

Having this aim in mind, a course was designed and imparted to Master of Architecture Students at the Melbourne School of Design during the summer term of 2022 by Professor Justyna Karakiewicz and Guillermo Rojas-Alfaro. The subject took a step back from the basic principles of architectural representation and focused on designing an architectural project without a form. Or at least one in which, form was not a concern. Then, by forgetting about dimensions, composition or geometries for a while, the elective aimed to create awareness of more subtle qualities of architecture. The light of a place, its soundscape and acoustic response, the smell and texture of its materials, its sense of solidity and weight, its scale or the pace and conditions its programme imposes on its users, qualities that so far "cannot be represented" (Vesely,2004).

As a consequence of this, the design was two-folded. As forms, dimensions and geometrical composition are the basic elements of conventional architectural representations, the students designed an architectural project, but more importantly, they designed ways to communicate their projects. Without architectural drawings or physical or digital models, they had to imagine new representations, capable of making someone else be a participant in the experience of the atmospheric qualities of their design. The brief was something deliberately simple. They worked in groups imagining a cabin for an artist. A small project that was the result of a process composed of 5 consecutive design explorations.

#### 1. The atmosphere

Places make us feel at peace, foreign, uplifted, confused, stressed or joyful. They affect us. They condition our moods and behaviour, without us even noticing it. To start the design process, the students were asked to recall a place that has had an emotional impact on them. A place that has affected them in any manner and from which they remember that feeling. That vivid memory became the emotional tone or atmosphere of their proposal and the driver of their designs.



Figure 1. The sense of insignificance and mortality. (Di Mineo, E. Zhang, K. & Pan Ng, C., 2022)

#### 2. The context

Where the students were located at that time. The second exploration of design was an invitation to forget their city and return to them with an innocent mindset. As a stranger. They were asked to consider their city as the location of their design. Not a specific plot with idiosyncratic conditions, sizes and qualities, but as a context that radiates an atmosphere over their project. So, what were the key sounds in its soundscape? What were the pace and rhythms of the city? How was the air? Was it fresh, windy, damp, dense? Did it smell? How was the light in their city? Was it bright and blinding? Was it diffused and soft? What colour was it? They observed the character of their contexts and represented the qualities that resonated with the atmosphere they envision for their project.



Figure 2. Chaos, speed and danger in the city. (Chen, Y. Rousset, Y. Ten, N. & Thiengthamcharoen, P., 2022)

#### 3. The space

There are spaces of anxiety that seem narrow and hemmed in, limiting our room for manoeuvre. There are spaces of optimism in which, to the contrary, everything easily gives way as if you were flying through the air. Considering the emotional tone of their project, the students were asked to imagine the spatiality of their proposal. To picture themselves as the artist entering the cabin and moving across it and to imagine and represent the scale of their project, the time it would take to move from one place to the other and how the spaces reveal in motion. How was their space? Was it wide, narrow, tall, compressed, long? Was it continuous or fragmentary? Was it sharp or smooth? Was it simple or complex? They imaged space not form and represented it without using architectural drawings.



Figure 3. A dark and grotesque space. (Ames, C.J. & Hu, M., 2022)

#### 4. The material qualities

The fourth design exploration was a call for empathy. The students were asked to imagine which material qualities could their project have to achieve the emotional effect of their design and represent them aiming to convey their hapticity, detail, composition, balance and hierarchies. So, which texture could a tense place have? What could be the tonality of a cheerful place? How would the details of a relaxing place be? How cold or warm could the materials of an uplifting place be? To imagine a place under this logic was not only an act of visual endeavour. It was a process of embodiment and identification with their design through their sensorial imagination.



Figure 4. Ethereal overlapping materials in a bedroom. (Handoko, T., Li, Z. Sheng, Y. & Shi, M., 2022)

#### 5. The tangle

By the end of the course, the students were asked to make a synthesis of their process. So far the students established contextual, spatial and material conditions to create an atmosphere. In this fifth exploration of design, they were asked to fuse them into a tangle. Using their previous explorations, they tested how these, so far discrete, conditions react in contact with each other and what could be the outcomes of their project as a whole. So, what would happen if they collide the yellow horizontal light of Melbourne's sunset, the sense of heaviness and compression of a writer's office space and the rough textures of handmade bricks in their design? How would these conditions affect and be affected by each other? What would be their balance in a project and their representations? In the tangle of these conditions, the total effect of their project was attempted to be summoned.



Figure 5. Storyboard of "The Ebb and Flow". (Handoko, T., Li, Z. Sheng, Y. & Shi, M., 2022)

#### **Atmospheric Representations**

In total over 350 representations were produced in this course. These came from revisiting memories, observing urban contexts and imagining unexisting architectural spaces. With its problems and limitations, the attempts to convey the atmospheric qualities of a project served as an opposition to the conventional modes of architectural representation. Through ambiguity either by diffuseness, ambivalence or incompleteness—, these attempts managed to insinuate the atmospheric tone of an architectural project. The students' work did not seek precision, clarity, and boundaries as typical architectural drawings would. On the contrary, their representations extolled the value of the indeterminate as, through it, more ambiguous, diffuse and unstable conditions can be made visible.

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## ON HYBRIDITY: EXPLORING THE HOUSE-MUSEUM TYPE

Keywords: Architecture; museology; house-museum; typology; hybridity

Our assumption of the house as an architectural type is that it serves a singular function: to accommodate the quotidian rituals of private life. The house-museum type, by contrast, expands these workaday horizons to incorporate the provision of display, engendering a process of hybridisation made explicit by the very hyphen of its compound moniker. We are familiar with other residential types in which everyday living coalesces with contrasting functions – embassy, convent, shophouse – but it is only the house-museum that integrates the display of cultural artefacts into an otherwise domestic environment.

The idiosyncrasy and academic fascination of the house-museum are manifest precisely due to its hybrid nature: *house* and *museum* are understood in typological and programmatic terms as antithetical, not symbiotic. The house is private, domestic, intimate; the museum is public, civic, formal. The reconciliation of these competing agendas inevitably summons a process of negotiation, an abiding tussle that is present throughout the various phases of the design process and emerges as the heart of this research, introducing to the study the notion of hybridity (both, and), rather than the subsumption of one within the other (either, or). In the simplest terms, we are saying that the house-museum is defined both conceptually and empirically by its simultaneous evocation of two types: house and museum.

#### Hybridity as a Concept

The term 'hybrid' is first found in biology in the early 1600s, taken from the Latin hybrida or ibrida, used originally to describe

the crossing of a tame sow and a wild boar. For a time thereafter, the term was (somewhat amusingly) used to describe the 'crossing' of a Roman man and a non-Roman woman, with the *tame-versus-wild* dialectic xenophobically implied. Early mythology was replete with hybrid creatures – Minotaur, Centaur, Sphinx, Pegasus – but beyond mythology the history of hybridity since its pre-Enlightenment adoption has essentially tracked within two unrelated fields.



Figure 1: Richard Giblett, Mycelium Rhizome, 2009 © Richard Giblett

The first field is of science, specifically biology, in which hybridity refers to any plant or animal with parents of different species; the tangelo and the mule step forward as examples. This version of hybridity is taxonomical in nature and locates the notion strictly within typological discourse. The second field is of the humanities, specifically linguistics, but recent scholarship has expanded our focus in acknowledging that the study of mixed languages can be seen as a metonym for the sociological and biological mixing of human cultures; where cultures travel and merge, so do languages. Alongside linguistics, the mixing of ethnicities throughout history is tracked within the field of cultural theory, beginning with Imperialism and evolving via Essentialism all the way to contemporary Post-Colonialism. This ideological journey is fraught with a political anxiety characterised by too many low points to mention.

The linguistic outworking of hybrid concepts, while relevant to the history of the term, is broadly irrelevant to its investigation within the notion of typological hybridity in architecture. One aspect of cultural theory, however, from which we might borrow an approach begins with renowned social theorist Homi Bhabha, whose decades-long engagement with post-colonialism draws on the fields of psychoanalysis and linguistics. Notably, in Bhabha's thinking, hybridity is a *state of flow* characterised by ongoing interactions. This expansive, dynamic and temporal rendering of hybridity liberates the term from the stasis and strict binary of genetic biology.

From here the stage is set for the work of sociologist Jan Nederzeen Pieterse, who extends Bhabha's multivalent view of hybridity as it relates to globalisation, describing hybridity as *'the rhizome of culture.'* For Nederzeen Pieterse, the dual prongs of hybridity (ethnicity and culture) can be framed in either negative or positive modes depending on political outlook, education and prejudice. Biologically, ethnic mixing can be seen negatively as taint or dilution, or positively as enrichment; anthropologically, ethnic mixing through a negative lens suggests homogenisation, modernisation, even westernisation, while the counter view implies broadness, enrichment and learning. Richard Giblett's pencil drawing *Mycelium Rhizome* (fig.1) offers a potent image to illustrate Nederzeen Pieterse's premise, which serves us well as we consider hybridity in architectural terms as it suggests simultaneous inter-relatedness on numerous fronts.

#### **Exquisite Corpse**

Another potent image that also belongs in the exploration of hybridity is that of the Exquisite Corpse (from the French, *ca-davre exquis*). A concept as much as a thing, the Exquisite Corpse was born in 1920s Paris as a parlour game called *Consequences*, invented by the founding Surrealists and comprising a sheet of paper that was folded and passed between participants – each of whom added in turn a word of their own, in ignorance of what came before. The resulting phrases were predictably absurd (hence the fun), leading to phrases like that which spawned the term: *'The exquisite corpse will drink the new wine.'* 

Andre Breton and his Surrealist friends then evolved the game into pictorial form: a sheet of paper was once again folded, but

this time each segment featured a part of a creature's anatomy. The resulting horizontal strata of a man's legs supporting a woman's torso, for example, were humorous – certainly – but also, for the Surrealists, highly instructive. In Breton's own words:

'Finally, with the Exquisite Corpse we had at our command an infallible way of holding the critical intellect in abeyance, and of fully liberating the mind's metaphorical activity.'

Incongruity was achieved in the absence of self-consciousness, and while the overall images were beguiling in their wild departures from convention, there were fertile passages in the drawings where each stratum met the next, a jarring transition between unrelated subjects that served to advance the existing conception of two key devices of composition and assemblage: collage (visual arts) and montage (cinema).

The playful aspect of the Exquisite Corpse is commonly repurposed into the low art, if we dare call it that, of children's books and puzzles, in which strata of animal parts can be flipped and haphazardly interspersed: a lion's body with giraffe legs and a peacock head the potential result. In high art we find examples also, most notably the important set of drawings by Jake and Dinos Chapman (fig.2). The Chapman Brothers' absurd renderings of mismatched anatomies return us to the earlier mention of well-known mythological hybrids: Minotaur, Centaur, Sphinx, Pegasus. In each case, the creature becomes a ridiculous melding of unrelated yet aspirational characteristics. (What could be more aspirational than Pegasus – a horse that can fly?) As we look for evidence of collage and montage in our house-museum examples, it is easy in considering the ground floor plan of the Lyon Housemuseum, for example, to ponder whether planimetric cut-outs of the white cube and black box that define its museological program were, in the beginning, crudely inserted – collage style – amid an otherwise normative domestic interior (fig.3).

#### Hybridity and the House-Museum

A discussion of hybridity in the architecture of the house-museum necessarily centres around a sincere and specific question: precisely what is being hybridised in the case of the house-museum type? In coming to understand the dynamics within the cohort of case study buildings, it is instructive to locate each along



Figure 2: Jake Chapman & Dinos Chapman, Exquisite Corpse, 2000 © Jake & Dinos Chapman



Figure 3: A collage-like insertion of the white cube space within the interior of the Lyon

an inevitably reductive spectrum that exists between house, at one end, and museum, at the other. The continuum allows us to map the degree to which a domestic or museological spirit is manifest in the building. In the simplest terms: does it *feel* to the human subject more like a house or a museum? It becomes evident that the buildings located most closely to the midline of the continuum are the most thoroughly hybridised – that is, they exhibit with such even weighting the discernible characteristics of each parent type that the oscillation between alternating readings as house or museum develops an almost Gestalt presentation. Throughout the circuit of the Lyon Housemuseum, for example, the human subject simultaneously encounters both domestic and museological tropes (fig.4).

HOUSE	Almora	Ebsworth	Lyon	Schwartz	Kramlich	MUSEUM
	Cranford	Cloudline	House of Light	Rachofsky	Dalle Nogare	



Figure 4: Explicit museological devices pervade the domesticity of the Lyon Housemuseum © Lyon Housemuseum

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Figure 6: Integration of time-based artwork at the Kramlich Residence © New York Times

ing tropes – in this case, the primacy of display – a museological essence pervades the architecture and the embodied experience of the building (fig.5). It is clear we are dealing with a house, first, with museological characteristics that are felt second, like an architectural coda. By contrast, at the other end of the spectrum, the Kramlich Residence presents as an almost exclusively museal environment – the display demands of the time-based works that comprise the collection quash any hint of domesticity to a negligible extent (fig.6). It is a house by definition, in the sense that its residents sleep under its roof, but if residential characteristics make an appearance in the building it is a cameo, at most.

#### **Hybrid Vigour**

In understanding more deeply the roles that history and historical precedent play in typological thought, we come to understand perhaps for the first time the embedded intricacy or complexity of a hybrid type: we are dealing with a permutation (rather than merely a combination) of the relative histories of two, hitherto unentwined, types. And so, while the ordering of the built world into typological classifications is by necessity a reductive process (as we know from Rossi, Argan, Franck, et al.), the hybridisation of unrelated types elicits the opposite reflex – it allows for ideological expansion, newness, innovation.

Figure 5: Cabinet as display armature at the Almora House © John Gollings

The tension – or *shimmer* – between two identities is manifest throughout the experience of the building. This resistance to settle invokes a unique phenomenological profile: the adrenalizing effect of the tension makes for an experience of both the building and the art it contains that is somehow supercharged. This experiential rapture seems to eschew that which a house or a museum in pure form might typically achieve, which partly explains the fascination and spellbound reception of the visiting public.

As we depart from the midline of the continuum, the Gestalt tension departs too. The buildings that are located most closely to one pole or the other present more as mutants of a singular parent type; it is clearer which type was the origin and which entered as a typological inflection. At the Almora House, for example, we are dealing in many respects with a conventional residential building, yet by the presence of one of the hybridisNotably, the resistance of a hybrid to *land*, so to speak – that is, to arrive at a point of resolution or straightforward identity – is at its heart antagonistic to the extant discourse of type and typology. One of the explanations for the vacillation in the perceived usefulness of typological scholarship in architecture is precisely the restrictive, reductive or essentialising nature of the discussion. In contrastiong the historical requirement for stasis as a characteristic of type, and the defining presence of flux in hybridity, we realise the poetic justice that underscores the legitimisation of the house-museum as a hybrid type: it is neither, and both, all at once.

In biological terms, this 'greater-than-the-sum-of-the-parts' quality is known as *hybrid vigour* — evidenced in animal hybrids, for example, as an offspring maturing to be taller or stronger than either parent. In recognising the tension that stems from the competing agendas that define the identity of each pole or parent type we can begin to appreciate that a hybrid type needn't aspire to resolution or stasis. Hybridity in this framing is a state of being, not a conclusive reckoning — a state that makes possible the ongoing negotiation of identity. The lack of stability that arises from this negotiation makes manifest the coexistence of conflictual relationships in a new kind of architectural form and museological experience.

#### Footnotes

[1] The house-museum is defined in this paper as a residential dwelling that has been designed by an architect with the explicit priority of displaying a private collection of art.

[2] An embassy combines dwelling and diplomacy, a convent (or monastery) combines dwelling and religious practice, and the shophouse found commonly in southeast Asia combines dwelling and commerce. If we consider the 'Soho townhouse' type, as developers refer to a semi-detached terrace house with a discrete space for work (commercial or mercantile), it is interesting to note the degree to which the workfrom-home imperatives of the recent Covid era have engendered both a hybrid occupation and conception of private dwellings – an evolution that is certain to impact on the next generation of residential design. [3] Oxford English Dictionary. (n.d.). Retrieved 22 February 2022, from https://www.oed.com/

[4] Oxford English Dictionary. (n.d.). Retrieved 22 February 2022, from https://www.oed.com/

[5] The notion of craniometry offers an anthropological nadir – where pseudo-scientific models were deployed in the United States to argue the biological inferiority of Africans, Asians, Native Americans and Pacific Islanders.

[6] It is appropriate to mention that Bhabha's detractors criticise the notable avoidance in his work of the two most regrettable aspects of colonialism: epistemic violence and economic exploitation.
[7] Bhabha's allowance for temporality liberates linguistics from a synchronic approach, which focuses our engagement on a frozen point in time, to a diachronic approach in which we engage with language as it has developed over time and accept its being in an ongoing state of flux.
[8] Nederveen Pieterse, J. (2015). Globalization and Culture: Global Mélange (Third edition). Rowman & Littlefield.

[9] Cadavre exquis translates literally to exquisite cadaver.
 [10] Andre Breton, in Breton Remembers. (2008, January 27). https://web.archive.org/web/20080127195653/http://exquisitecorpse.com/definition/Bretons\_Remembrances.html

[11] Ibid.

[12] Ibid.

[13] The cinematic reference is interesting here because Le Corbusier had interests in both Surrealism and cinema, as we'll learn in the later chapter that deals with his 'invention' of the promenade architecturale that plays a central role in our conception of Scenography (or the moving eye).

[14] We know from personal conversations with the architect, Corbett Lyon, that collage per se was not deployed as a design method; however, the insertion of typologically hermetic volumes (white cube and black box) within the building volume can indeed be framed in conceptual terms as resulting from a compositional device akin to collage.

[15] Lyon Housemuseum (Melbourne, 2009); designed by architects Lyons.

[16] Almora House (Sydney, 2017); designed by architects Tonkin Zulaikha Greer

[17] Kramlich Residence (Napa Valley, 2016); designed by architects Herzog & de Meuron.



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## 'EXTRA-HEIGHT': THE SPATIO-TEMPORAL DI-MENSION OF THE CITY

Keywords: Spatio-Temporal; Indigenous Practice; Encountering; Architecture; Urban Design



Figure 1. "And therefore as a stranger give it welcome" – cover of the first edition

It is somewhat incongruous that a novella penned in 1884 by an English clergyman with an interest in non-Euclidean geometry may provide a useful frame in which to consider contemporary indigenous architecture in New Zealand. The book is *Flatland: A Romance of Many Dimensions*. The author Edwin A. Abbott (1838-1926) was an Anglican priest, Shakespearean scholar and schoolmaster. Presumably somewhat nervous about his reputation he published the work under the pseudonym A Square. Set in a two-dimensional world, the tale is presented as the memoirs of a mathematician and belongs to a niche genre of mathematical fiction. It is described as a 'barbed satire of the hierarchical world' of Victorian era England. (Abbott, 1992: i)

The eponymous Flatland is populated by shapes inhabiting a plane and constitutes the universe of our narrator A Square. His society is underpinned by a disarmingly simple geometrical rule: the more sides a shape has, the higher the class of person. In this way, all women, the lowest of beings, are lines; soldiers and tradesmen are triangles; squares and pentagons are the professional classes and polygons with six sides and above form the nobility. A shape so multi-sided as to approximate a circle is a member of the highest class, the priestly Circular order.

In Part 1 of the book titled 'This World', A Square describes to us the nature of his society - marriage, genetics and social mobility, their housing and art, gender roles and climate, a history of unrest and uprisings, their civil society and institutions. Each of these vignettes presents to the reader a world that is quaint and slightly ridiculous, but in which we readily recognise the sociological structures of power and inequity of our own existence.

In Part 2, entitled 'Other Worlds', A Square encounters a stranger. A sphere descends upon Flatland bearing knowledge of an other way of being - the world of three-dimensionality. The square, whose vision and understanding of the world is constrained only to two-dimensions, cannot comprehend a solid form, a circle who is made of 'many circles in one'. To prove his solid form, the sphere slowly rises out of Flatland, diminishing in size until he appears to vanish entirely (Figure 2). Despite this experience, in which the disembodied voice of the sphere continues to try to convince the square of his existence, the square remains mired in his own view and refuses to accept the reality of three-dimensions.





Figure 2. "I winked once or twice to make sure that I was not dreaming. But it was no dream." – A Square

So, the sphere returns to Flatland and a heated discussion follows. He implores that the square should 'know' a solid by geometrical inference: a zero-dimensional point extended upon itself forms a one-dimensional line; a line extended upon itself forms a two-dimensional square; a square extended upon itself becomes a three-dimensional cube. The reasoning is laid bare in the geometric sequence 1,2,4,8, being the terminal points of the entity; the arithmetical sequence 0,2,4,6 being the sides; and the corresponding dimension following the progression 0,1,2,3 (Figure 3). The square accepts the theory but continues to reject the reality, and instead accuses the sphere of sorcery and attempts to kill him. Thus, the sphere resorts to action. By force he drags the square upwards and outwards, into the third dimension, from where he can view his world as we can see it - nothing more than 'a vast sheet of paper' (Abbott, 1884).

This is the first frame useful for considering contemporary indigenous architecture - that of representation. The novella puts forth that reason and argument are only able to go so far to demonstrate an other form of knowledge. One must be willing and able to show. During their argument, the sphere implores 'Your country of Two Dimensions is not spacious enough to represent me, a being of Three, but can only exhibit a slice or section of me, which is what you call a circle' (Abbott, 1884). When engaging with indigenous concepts of place it is useful to consider that the western framework of socialised space is not a position from which indigenous perspectives can be wholly examined. What is communicated by an other at the point of encounter is therefore always somewhat performative, but nonetheless revealing.



Figure 2. "I winked once or twice to make sure that I was not dreaming. But it was no dream." – A Square

So, having acquired the knowledge of three-dimensionality, what becomes of our protagonist? [Warning: Spoiler ahead!]. The humbled square desires more knowledge and challenges the limit of the sphere's own understanding. Emboldened, he asks to be shown the fourth dimension. The sphere replies: 'Men are divided in opinion as to the facts. And even granting the facts, they explain them in different ways.' (Abbott, 1884) The square presses on, desperate to be taken to a 'more Spacious Space' where a 'still more perfect perfection' exists, until in anger the sphere violently returns him to the world of two dimensions. The novel closes with A Square trying to share his knowledge with the other inhabitants of Flatland, only to be imprisoned as a heretic by the Circular class. In isolated detention he is haunted by visions of the sphere and the cube, his fading memory of the encounter seeding doubt and madness as the years pass. Believing himself to be a martyr of Truth, he concludes:

"I exist in the hope that these memoirs, in some manner, I know not how, may find their way to the minds of humanity in Some Dimension, and may stir up a race of rebels who shall refuse to be confined to limited Dimensionality." – A Square (Abbott, 1884)

On its release, *Flatland* did not receive much attention. But it is interesting to consider that it predated the theory of relativity by a quarter of a century. Einstein's theory that there is no absolute frame of reference, but rather that an object's velocity, momentum or experience of time is always measured in relation to something else changed the course of western knowledge whereby 'time became inextricably intermingled with space' (Hoffman, 1952). The premise of Flatland is that knowledge too is always relational. This is a second frame for which Flatland is a useful tool to consider contemporary indigenous design practice. Abbott's novel was written in the closing years of the nineteenth century at a time indigenous knowledges across the globe were being systematically denied by the forces of imperialism. For all that has been lost through colonial processes, relational knowledge is an enduring principle that underpins the survivance of indigenous methodology and practice through 250 years of colonisation (Denzin et al., 2008; Grant et al., 2018; Smith, 1999). It is not a concept that indigeneity needs satirised in literature or discovered by scientific method to understand today.

In Abbott's preface to the second edition, he used the term 'extra-height' to describe the fourth dimension. Following Minkowski and Einstein the fourth dimension is accepted today as spacetime. It is this 'extra-height', manifested as a spatio-temporal proposition that is becoming more apparent in the contemporary context of New Zealand's cities, a process being led by Māori. The production of built environments in Auckland, Wellington and Christchurch are increasingly informed by matauranga Māori, a knowledge system that conceives of the temporal in a way that is 'other' to existing urban design and planning. Mātauranga is evident in the implementation of Te Aranga Cultural Landscape Strategy across Auckland (Kake & Paul, 2021) and the work of organisations such as Matapopore in Christchurch (Whaitiri, 2021). These designed environments (Mossman, 2021) move beyond discussion of concept and towards demonstrable action.

The extent to which this spatio-temporal activation is occurring in our civic realm demonstrates a re-emergent indigenous design sensibility. Mātauranga is underpinned by whakapapa, a term that encompasses the relational and interconnected quality of existence. These contemporary places may provide a means to deepen our understanding and engagement within our cities (Matunga, 2018). In the age of the anthropocene we have mastered the three spatial dimensions, bending resources and material to the service of humans. Increasingly, built environment practitioners are turning their focus to the temporal dimension to address climate change with whole of life carbon, adaptive reuse and intangible heritage being several examples. The relational understanding of indigenous practice is a means to further explore the temporal dimension. It is the 'extra-height' from which we might draw a new perspective of our prevailing dimensionality.

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Figure 1. Abbott, E.A. (1884) from https://www.manhattanrarebooks. com/pages/books/2038/edwin-abbott-abbott-pseud-a-square/flatland-a-romance-of-many-dimensions?soldItem=true Figure 2. Abbott, E.A. (1884) from https://www.gutenberg.org/ files/201/201-h/201-h.htm Figure 3. By author (2022)

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## MATERIAL ENCOUNTERS: TRADITIONAL CRAFTS-MANSHIP AS SPATIOTEMPORAL PERFORMANCE IN THEATRES OF MEMORY

Keywords: Heritage Conservation, Traditional Craftsmanship, Maintenance, Tacit Skills, Embodied Knowledge, Materiality, Procurement, Authenticity, Quality, Australia, International

'We are always in these days endeavouring to separate intellect and manual labour; we want one man to be always thinking, and another to be always working, and we call one a gentleman and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen in the best sense.' (John Ruskin, 1853, p.187)

My research is motivated by a need to develop more holistic understandings of the traditional knowledge and specialist skills required to conserve our historic built environment. Traditional craftsmanship in built heritage conservation is defined here as the work of professional craftspeople engaged in the traditional construction and repair of historic places. This PhD research will examine the role of traditional craftsmanship in maintaining enduring, adaptable, and resilient cultural identities through the preservation of the historic environment. Drawing on comparative case studies from within Australia and abroad, the aim of my research is to contribute new knowledge to our understanding of safeguarding traditional craftsmanship as intangible cultural heritage, as espoused by the 2003 UNESCO *Convention for the Safeguarding of the Intangible Cultural Heritage*.



Figure 1. In situ stone carving. Francis Ormond Building, Melbourne, 2019. Source: Author

My research will activate notions of cultural places as assemblages of space, time, and materials within a framework that understands the practice of heritage conservation as a lived process through time. Gathering firsthand ethnographic accounts of the traditional craftsperson's experience in contemporary conservation practice, I will examine the ways specialist craftspeople engage with the spatiotemporal materiality of place through their work.

Globally, built heritage conservation evolved throughout the twentieth century as countries sought to collaborate in the creation of charters and principles to guide and sanction best conservation practice. Professionalisation of the discipline has accordingly seen conservation management flourish as an industry in more recent decades. However, the industry has experienced limitations in applying universal quality standards across the varying contexts of conservation practice in the built environment. Concomitantly, contemporary construction procurement practices, transformed by the post-industrial pursuit of mechanised and automated efficiency, have led to a devolution of traditional, manual skill development pipelines. Consequently, the world has experienced a decline in the availability of highly skilled specialist craftspeople compounded by diminished training opportunities in traditional building crafts. Thus, a crisis narrative has come to characterise traditional craftsmanship within a wider discourse of fragility in conservation (Scott, 2016). Notwithstanding, these skills remain vital to conservation practice. There is therefore a need to apply new perspectives to the way we understand and safeguard these endangered professions. My research will examine whether opportunities for improved heritage conservation outcomes exist in a deeper understanding of the more elusive, intangible, tacit skills, and embodied knowledge inherent in the everyday practice of traditional craftspeople.



Figure 2. Welsh slate restoration. Methodist Ladies' College, Kew, 2018. Source: Author

Spanning disciplinary boundaries of architecture, history, material science, and construction management, built heritage practitioners seek to balance conservation philosophy with market forces, whilst remaining faithful to shared cultural values of place. Authenticity and quality in conservation repair is principally determined using criteria relating to measurable, tangible conservation outcomes. Yet experiences of authenticity are found not solely in the physical fabric of buildings, objects, or cultural practices, but resonate in the networks and spaces between them - in the tools, the actors, and the actions (Jones & Yarrow, 2013; Gao & Jones, 2021).



Figure 3. Intangible interconnections with place are formed through unique spatial and material encounters. St Paul's Cathedral, Melbourne,

Recognition of the spatial interrelations within and between built forms and the human and non-human agents that inhabit them is at the nucleus of architectural design. Yet exploration of the distinctive physical and spatial interconnections within and between built forms and the craftspeople who maintain them is not well represented in research. Traditional craftspeople bear witness to the shifting materiality of place through formal and informal everyday encounters of touch, sound, smell, taste, and visual observation. Cumulating valuable layers of experience and knowledge through surveys, cyclic monitoring, maintenance, conservation, and repair, traditional craftspeople form intimate and often ongoing cognitive connections to place in ways unique to their practice. The objective of this new study is to explore the firsthand experiences of traditional craftspeople engaged in built heritage conservation and contribute new knowledge to inform how we attend to and preserve our historic places into the future.

My research seeks to question whether rationalist methods of assessing and measuring material conservation outcomes, that have emerged from the spheres of conservation science and construction management, might neglect the potential that exists in better understanding the firsthand experience and knowledge of craftspeople engaged in conservation practice. More than a century after John Ruskin reflected on the separation of intellect and manual labour (Ruskin, 1851), Rosemary J. Coombe observed that built heritage management is dominated by market ideologies that seek to commodify cultural resources and define human capital in terms of economic yield (Coombe, 2012). Challenging the narrative of fragility that has come to define traditional craftsmanship in contemporary heritage discourse, my study will explore the perspectives, practice, and experience of traditional craftspeople engaged in built heritage conservation. Can the maintenance and preservation of historic environments be enriched by discovering value in the unique spatial and physical interrelations and intangible connections that exist between historic environments and those who attend to their shifting materiality? The answers will come by examining the comparative perspectives of craftspeople within Australia and abroad.

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## EXPLORING THE LIVEABILITY OF URBAN SPACE FOR VISUALLY IMPAIRED PERSONS CASE STUDY: THE CITY OF MELBOURNE

Keywords: Visually Impaired Person, Liveability, Urban Space

This research explores the liveability of urban spaces for visually impaired persons (VIPs) in central Melbourne. Liveability is a broad concept that generally refers to the quality of life in a particular place. Liveability has become a buzzword, with global city rankings aiming to quantitatively assess the liveability of cities. However, such rankings are not inclusive and reflective of differences between various social groups. In academic literature, the concept of urban liveability has been discussed from different views such as; physical structure (Jacobs, 1961), city image (Lynch, 1960), and activities (Gehl, 1987). Nevertheless, they have not specifically considered VIPs who, due to diminished vision, have different experiences in the city.

Visually impaired persons as a group of citizens, due to a lack of vision, can have different experiences. Research on VIPs' experiences as well as urban design and planning practice has deeply focused on the wayfinding aspect and infrastructure to overcome this issue. However, without undermining the importance of the wayfinding aspect, the liveability of an urban space for VIPs cannot be defined by focusing on one aspect. This research aims to reveal a deeper understanding of urban liveability for vision-impaired persons by aiming to answer the following question:

How can the liveability of an urban space be defined based on visually impaired persons' experiences and perceptions?

As a result of the multifaceted nature of urban spaces, a multi-method approach has been applied for gatherings, analysis and validation of the findings. The methodology consists of seven stages; interviewing three groups including; urban design experts, people involved with VIPs' issues, and VIPs themselves. Other methods include; word games, a walking interview, diary recording and non-participant observation.

This research provides a broad and a detailed approach regarding the relationship between VIPs and public spaces in liveability discourses. At the theoretical level, it demonstrates that an intended outcome of this research is to advance understanding of VIPs' experiences in urban spaces beyond the solely utilitarian aspects such as wayfinding. On the methodological level, it will develop a methodology to capture these groups' urban experiences in a non-reductionist way. On a practical level, it will advance understanding of how urban design can mediate the conflicting desires of visually impaired persons and non-visually impaired individuals, and how VIPs should be considered in urban design practices.



Figure 1.

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![](_page_37_Picture_5.jpeg)

Figure 2.

![](_page_37_Picture_7.jpeg)

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Shirin holds a bachelor's degree in architecture and completed her master's in urban design. She has professional experiences in the architectural sector in Australia. Her PhD research is focused on understanding the liveability of urban spaces for visually impaired persons and their interactions within public spaces. Her research interests in general include behavioural design, inclusive cities, urban morphology, placemaking and urban design theory. She is a casual tutor at Melbourne School of Design.

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## URBAN INFORMALITY: THE EMERGENCE AND AP-PROPRIATION OF PUBLIC SPACE

Keywords: Informal Settlement, Morphogenesis, Public Space, Urban Informality

![](_page_38_Picture_3.jpeg)

#### Introduction

Informal Settlement is the primary mode of urban production today. It comprises a multifaceted and complex field of concepts which makes it difficult to describe within existing urban theories, processes, and typologies, and as a result remains understudied (Kamalipour & Iranmanesh, 2021; Lutzoni, 2016). As a mode of urban and social production it becomes increasingly interesting because it is highly contextual, inherently social, and emergent from life as it is lived, revealing some of the limitations and possibilities of public space in the contemporary city (Figure 1).

![](_page_39_Picture_2.jpeg)

Figure 1. Appropriations of public space

#### **Social Spaces of Possibility**

Within the context of accessibility and inclusion many refer to the 'end of public space' ascribed to the growing privatization of space; cultures of consumption & consumerism; and over-policing (Avermaete, 2001; Carmona, 2010a, 2010b; Chen et al., 2018). While this has resulted in less space available for unprescribed use by citizens, especially those from marginalised groups, Mitchell (2015) sees this opening up public space anew through new modes of urban sociability and mutual struggles for social justice. Urban minorities that are present and visible in public space can force dominant society to confront its exclusions and challenge fixed binaries (Mitchell, 2015; Vaiou & Kalandides, 2009). Hou's (2010;2020) Guerrilla Urbanism describes insurgent activities in public space. This is a loose adaptation of Holston's 1998 Spaces of Insurgent Citizenship. While the project of Modernism was a means to an end, a fixed vision within which all aspects of life were to transform; Harvey (2012) sees Lefebvre's concept of heterotopia in alternative possibilities, not arising from a conscious (and heterogeneous) plan, but through liminal social spaces of possibility.

The most relevant debates around urban informality in Southern Africa centre around the transient nature of urban constructs; the irrevocable role of informality therein; and those that call for a new approach to the theories of planning and urbanism that might help to understand non-normative contexts (Bremner, 2000; Dinath, 2014; Harrison, 2008). While the realities of urban life and work in the global North differ vastly from those of the global South, most of the literature and global conceptions of public space come from the global North (M. Chen et al., 2018). Such literature is permeated with perceptions of what cities should look like, creating dichotomies of legal/illegal, formal/ informal, inclusion/exclusion, order/disorder; that tend to marginalise the informal. Researchers continually challenge ongoing perceptions that informal settlements are somehow 'underdeveloped' or 'regressive', and contest the conflation of informal settlements with *slums*, (Dovey & King, 2011; Gilbert, 2007; Jones, 2019). Many contribute the questionable policy responses to upgrading (eviction/demolition) to the need for expressions of political competence, image, and the desire for order (Dinath, 2014; Dovey et al., 2019; Jones, 2019; Tyrwhitt, 1947). Marshall (2009) distinguishes between 'systematic' - and 'characteristic'

order, the prior being the easily identifiable (planned) urban fabric. 'Characteristic order' is generated by contextual and social norms and values that produce unique forms such as those seen in informal settlements.

#### **Contribution & Methodology**

The thesis sees public space as a vehicle for thinking critically about the processes of urbanism and of our living together. It aims to document the emergence and appropriation of public space in informal settlements, over time, guided by three overarching questions: what constitutes public space in informal settlements, are there different 'typologies'; what are the main factors that contribute to their morphogenesis at various scales; and how does the appropriation of public space influence settlement intensification and the continued emergence of collective space over time? Primary research will be conducted through in-depth case studies. Figure 2 shows the intensification of three informal settlements over more or less a decade using Google Earth satellite imagery. The first triad shows a section of Kayelitsha in Cape Town, South Africa, intensifying from a single shack typology to integrating planned roads and interstitial spaces over time. The second set of images shows the growth of Rua da Samba in Luanda, Angola, where land is literally produced by residents through expanding into the bay east of Areia Branca beach. Angelo in Boksburg, South Africa, is captured in the third set: two varying settlements on either side of the forced demolition of the settlement in 2007. In just fourteen years the settlement has intensified in a highly 'organised' manner with land set aside for a soccer pitch which continues to re-emerge over time. In all three cases varied typologies are apparent: from larger negotiated spaces to smaller residual ones.

![](_page_40_Picture_3.jpeg)

Figure 2. The intensification of three settlements over time

Cases will be studied and documented at various interrelated scales, with sub-questions, methods and depth varying between them. In the case of Angelo for example (Figure 3), the settlement's emergence, between an existing main road and transit node, could be mapped from archival satellite imagery, revealing the morphogenesis of public space networks over time. An intermediate scale should reveal spatial qualities; building- and open space typologies; public/private interfaces etc. Studying select spaces at the immediate scale could be useful in documenting daily rhythms, transient appropriations, and various actors. A successful case study should allow the thesis to present

a narrative, without generalisation, that might allow eventual interpretation across specialisations. The study intends to build onto existing bodies of knowledge on the morphogenesis of informal settlement as an inherently contextual and multi-scalar process, so that extant order (social and built), might be better understood.

![](_page_41_Picture_1.jpeg)

*Figure 3. Hypothetical scales of study illustrated* 

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## MEASURING URBAN FORM DYNAMICS: A MORPHOLOGICAL PERSPECTIVE TO THE PATTERNS OF CHANGE AND PERSISTENCE IN GRID CITIES

Keywords: Urban Grids, Morphology, Plots, Physical and Functional Change

#### Urban Grid as the Generator of Urban Form

The grid is the most common form of spatial organization and type of planning system utilized throughout the history. Argued by Kostof (1991), *"it is universal both geographically and chronologically"* (p.95), meaning the grid – or gridiron – has always been used in different periods of time since antiquity and at diverse contexts and localities. From the ancient times of Greek, Rome and Chinese cities to the idealized Renaissance towns; to the 19th century expanding cities like New York and Barcelona and colonial cities like Melbourne and Hong Kong; and even to the 20th century utopian forms, megastructures and contemporary practices, grid has always been existent in the idea of designing the urban space (Figure 1).

> Figure 1. Urban Grids in History (a: Hippodamus Grid in Miletus, b: Ancient Roman settlement of Timbad, Algeria, c: Ancient Chinese settlement of Xian, d: Ideal Renaissance City Grid, e: New York Commissioners Plan, f: Barcelona Expansion Plan by Cerda, g: Plan of Melbourne: Hoddle Grid, h: Villa Radieuse by Le Corbusier, i: Tokyo Bay by Kenzo Tange, j: Ijburg, Amsterdam)

![](_page_42_Picture_6.jpeg)

Grid is not only a form of order defining certain spatial rules, but also an 'open form' generating various future possibilities which are not imagined before. It has a capacity to produce infinite complexity and variety from a very simplistic pattern and persists through time by regulating emerging changes in the urban space. However, it should not mean that any grid is inherently adaptable and responsive to the emerging changes and transitions. Arguing that there could be distinctive physical qualities that may hinder or facilitate further adaptation and change, the research asks the question of 'how do morphological conditions of the grid affect the dynamics of long-term change and persistence in the built environment?'. In that sense, this research aims to develop an analytical framework to examine patterns of spatial change and identify possible morphological parameters explaining the levels of change and persistence in grid cities.

#### **Urban Form Conditions and Dynamics of Change**

The methodology and design of the research are framed within the field of urban morphology – which investigates the reciprocal relationship between physical form and dynamics of change in complex systems of cities. Although the definitions are various due to the difference in objectives and methods in morphological studies, Larkham (2005) argues that the essence of urban morphology is about understanding the inevitable complexity in form and formation: "Understanding the physical complexities of various scales, from individual buildings, plots, street blocks, and the street patterns that make up the structure of towns helps us to understand the ways in which towns have grown and developed" (p.1). In that sense, the research analyses the morphological conditions of the selected grid cities defined by (i) configuration of street network, (ii) composition of plots and (iii) spatial distribution of buildings and uses; and hypothesizes that existing material conditions of the urban space have a potential effect on the dynamics and patterns of change. Utilizing the methods and techniques of morphological analysis, the research adopts multiple case study research approach to test the hypotheses in a wider framework and to reach more generalizable findings. Three different case studies are identified for a comparative analysis and discussion: New York (US), Barcelona (Spain) and Melbourne (Australia). Morphological data used in this research is generated by digitizing the historical maps, cartographic resources, postal directories, cadastral maps, land-use records and aerial photos

dating back to various historical periods. The generated comprehensive database helps to understand the historical trajectories via multiple time frames and to achieve an extensive model of spatial change for each case study.

#### Role of Plot Structures in Guiding Patterns of Change and Persistence: The Case of Midtown Manhattan, New York

Being part of the abovementioned and ongoing PhD study, this paper limits its discussion to the effect of plot compositions and structures on the patterns of change and persistence in Midtown Manhattan, New York, between 1888 and 2021. Designed by the Commissioners Plan of 1811, the grid of Manhattan composed of rectangular urban blocks which are continuous throughout the whole island. The analysis area covers one of the central locations in Manhattan, named as Midtown, and it presents an exceptional variety in the composition of plots which leads a multiplied diversity in building typologies and land uses. Therefore, the area offers a chance to analyse the effect of plot structures on the patterns of physical and functional change and to conceptualize the adaptability of Manhattan grid to the emerging transitions through time.

Plot is the most basic unit of control used in the planning and design of settlements which is acquired by the division of land into legal spatial entities. Alternatively named as lot or parcel as well, plots define the status of land-ownership by separating the urban space into private and public domains (Oliveira, 2016) and they prescribe the character of the three-dimensional space via institutional rules and codes. From a morphological perspective, "the smallest cell of the city is recognized as the combination of two elements: the individual parcel of land, together with its building or buildings and open spaces" (Moudon, 1997: 7). Accordingly, argued by Bobkova (2019), "socio-economic use and performance of cities plus, ..., their visible aspects such as the form and height of buildings, are often simply a manifestation of the hidden order *imposed by the layer of plot systems"* (p.1). Containing both the built and unbuilt spaces within its boundaries, plot is the most essential module of urban space and it has a potential to affect various socio-spatial processes like land-use diversity (Marcus, 2010) and long-term evolution and change of built form (Conzen, 1960; Moudon, 1986).

The most fundamental morphological variable defining the spatial quality of plot structures is the size of plots. The categories of plot sizes are defined by considering the original plot size (250-500m2) designed in Manhattan at the beginning of 19th century and identified as extra-small (0-500m2), small (500-1000m2), medium (1000-2000m2), large (2000-5000m2) and extra-large (above 5000m2) respectively. Accessible plot density is another variable defining the number of plots accessible within 400-meters walking distance for each individual plot taken as the origin. While the size of plots defines the individual geometric quality of each parcel, accessible plot density quantifies the intensity of potential destinations reachable via street network and evaluates the character of plot structures in a contextual catchment area. While the higher values of accessible plot density are associated with fine-grain plot compositions defined by many and small plot subdivisions, the lower values indicate coarse-grain compositions of a few and larger plots. The last morphological variable defining the character of plot structures is accessible plot size diversity – which quantifies the degree of the diversity of plot sizes accessible within 400-meters walking distance for each individual plot taken as the origin. Calculated by the Gini-Simpson Index, accessible plot size diversity defines the degree of heterogeneity for the distribution of plot sizes within accessible reach.

In addition to these morphological variables, two types of measures will be discussed to understand the amount of change in the built environment - the amount of physical change and functional change between each analysis period. Excluding minor modifications and alterations of the buildings, physical change represents change and transition in built form via demolition and construction of the buildings. On the other hand, *functional* change is defined as the transition of the use of a building from one land-use category to the other, without changing physically. It represents the adaptive capacity and responsiveness of the built form for different land-uses. The morphological transitions between each analysis period in Midtown Manhattan will be presented along with the identified morphological variables. Thus, possible relationships between the morphological quality of plot structures and long-term physical and functional changes will be discussed critically.

The diachronic comparison of each analysis period reveals that plot sizes increase through time in Midtown (Figure 2). Due to

the various plot amalgamations to accommodate building typologies having larger footprints, fine-grain plot structure in the site has been replaced gradually with a coarse-grain composition. Though the number of smaller plots outnumber the larger ones in each analysis period, it could be argued that the overall plot structure loses its modularity especially along the major streets. At the edges of the site, some character areas retain their finegrain quality and accommodate various plot sizes implying the typological and functional diversity.

![](_page_44_Figure_4.jpeg)

Figure 2. Transformation of the Plot Structure in Midtown Manhattan, 1888-2021

Analysis of accessible plot density illustrates that coarsening of the urban fabric and the gradual decrease in the number of plots, from 1888 to 2021, resulted in losing the ability to offer access to various and many destinations in Midtown. In order to test the hypothesis of whether accessible plot density is a reliable metric to explain physical change, consecutive analysis periods are compared and plots accommodating physical change are identified. The empirical analysis indicates that plots having higher accessible plot density values are the ones persisting physical change more in each period. On the other hand, lower accessible plot density values are associated with relatively more physical change – meaning that coarse grain urban fabrics are more prone to physical transitions via building demolitions and new constructions. It would not be wrong to argue that the mutual support of many and small plots at particular locations make them more resistant to change and retain their urban grain qualities through time (Figure 3).

![](_page_45_Figure_0.jpeg)

Figure 3. The Relationship Between Accessible Plot Density and Physical Change

Analysis of accessible plot size diversity illustrates the degree of heterogeneity in plot sizes and it shows that how the original and homogeneous plot structure in Midtown has been diversified through time due to the emergence of various plot sizes. With intent to test whether accessible plot size diversity has a measurable effect on the patterns of physical change, plots accommo-

![](_page_45_Figure_3.jpeg)

Figure 4. The Relationship Between Accessible Plot Size Diversity and Physical Change

dating physical change in each period have been examined. The analysis highlights that plots having higher accessible plot size diversity values, i.e. heterogeneous plot compositions, manifest more and frequent physical change. Homogenous plot structures, identified with lower accessible plot size diversity values, have resisted to physical changes more in each analysis period (Figure 4).

In addition to the relationship between morphological variables and physical change, patterns of functional change deserve to be discussed further. Contrary to the patterns of physical change, functional changes between each period seem to occur in a more dispersed manner through the whole grid instead of clustering along certain street blocks. It shows that functions and uses are more dynamic and transitionary than built form and measures of accessible plot density and accessible plot size diversity could not explain functional changes well. Instead, the measure of individual plot size seems a quite successful predictor of functional change. For all periods of analysis, small and medium size plots have accommodated functional changes more successfully than the larger ones (Figure 5). The analysis shows that larger plots couldn't accommodate functional changes as much as the small and medium ones; because, as it is discussed previously, larger plots tend to be physically changed more often. Since the relatively big and bulky buildings on larger plots are usually designed for specific functions – which is a clear spatial manifestation of the so-called 'form-follows-function' approach – they have to be demolished and re-built each time to accommodate different programs and couldn't respond functional transitions.

![](_page_46_Figure_1.jpeg)

![](_page_46_Figure_2.jpeg)

Figure 5. The Relationship Between Individual Plot Size and Functional Change

#### In lieu of Conclusion

The findings of this ongoing research illustrate that different characteristic areas in the grid of Manhattan manifest various patterns of change and persistence over time. These dynamics of change could be explained with the identified morphological variables explaining the quality of plot structures. In that sense, accessible plot density and accessible plot size diversity are valid variables to explain physical change in Midtown. While character areas composed of many, small and homogenous plots show relatively higher resistance to physical change, coarse-grain and heterogeneous plot structures tend to be changed physically more often. In terms of functional change and adaptation, small and medium size plots perform better than the larger ones in each analysis period. These preliminary findings should be questioned with the help of different morphological variables and measures, and supported with a coherent statistical analysis to draw further conclusions.

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![](_page_47_Picture_7.jpeg)

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![](_page_48_Picture_17.jpeg)

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![](_page_51_Picture_1.jpeg)