UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Type Trails: Exploring the potential of typography as a system for storytelling in urban wayfinding design

by Sarah Jane Jones

Thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

under the supervision of
Professor Lawrence Wallen
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University of Technology Sydney
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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, **Sarah Jane Jones**, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Design, Faculty of Design, Architecture and Building at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

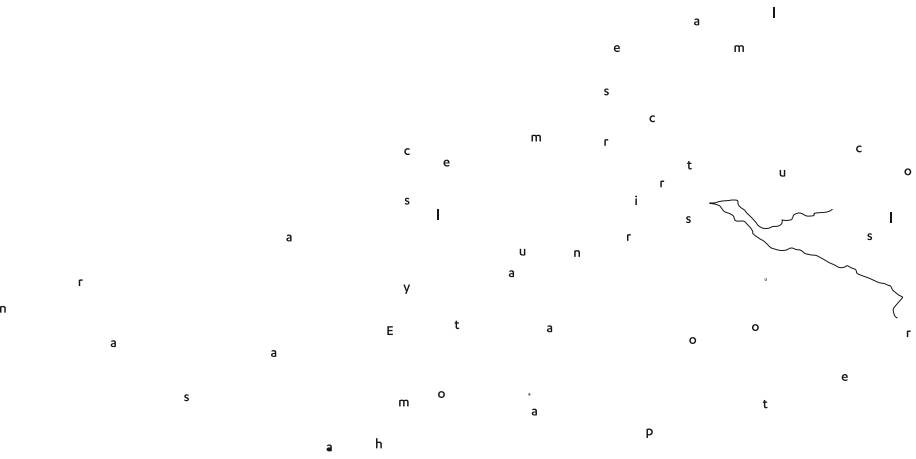
This research is supported by the Australian Government Research Training Program.

Signature: Production Note: Signature removed prior to publication. Date: **August 2021**

Type Trails

EXPLORING THE POTENTIAL OF TYPOGRAPHY AS A SYSTEM FOR STORYTELLING IN URBAN WAYFINDING DESIGN

SARAH JANE JONES



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THESIS FORMAT

This thesis comprises two components:

1 The written thesis:

This document combines pages of my critical documentation or research diary with my written thesis.

2 The practice-based component:

www.typetrails.com.au

Photography by the author unless otherwise noted.

CONTENTS

ACKNOWLEDGEMENT OF COUNTRY

I acknowledge the Aboriginal and Torres Strait Islander peoples of this country and their continuing connection to culture, community, land, sea and sky. I pay my respects to the Elders past, present and future. I would like to acknowledge the Gadigal people as the traditional custodians of the land where I live and work, and of the land where this research is situated, in the inner city of Sydney. I acknowledge that sovereignty has never been ceded. This research acknowledges the living culture of Aboriginal Australians that carries a continued spiritual, cultural, political and physical connection to this land today. This always was and always will be Aboriginal land.

ACKNOWLEDGEMENT OF SONGLINES

> The songlines of Aboriginal and Torres Strait Islander people connected clans from one side of the country to another. The cultural, economic, genetic and artistic conduits of the songlines brought goods, art, news, ideas, technology and marriage partners to centres of exchange.
>
> The Brewarrina fish traps were one such centre, the Lake Condah eel fishery another, Sturt's grain fields of the Warburton River region another and Melbourne's Botanical Gardens were the point of dispatch for the great Dreaming corroborees brought from the Australian Alps by such important philosophers as Kuller Kullup. (Pascoe, 2014, pp.129–130)

In many ways it seems redundant to be researching in the field of wayfinding design in a country/continent that has songlines and a history of impeccable individual ability in tracking and wayfinding. Songlines are one of the most intricate, highly structured and successful systems of navigation and wayfinding–an intricate web of storylines as pathways across this country that are sung.

> There are numerous epical stories that travel in storylines, some over long distances in the country. One of the longest known continuous songlines extends approximately two thousand kilometres from Port Augusta to the Gulf of Carpentaria. These sacred texts–their stories and songs containing a great depth of knowledge–are honored and preserved through ceremonies and sacred practices which recognize that the ancestral beings are alive in the country, though they may be sleeping or resting. (Wright, 2021, para. 23)

These storylines linked trade and economic, marriage and spiritual ties (Pascoe, 2014), and connected the Law across this vast land (Wright, 2021), lines of knowledge of story that were sung and passed down generation to generation, including stories that were passed on only to those who were allowed to learn (Wright, 2021). The experience of wayfinding in this context is a cultural story that is sung over time and distance, is intergenerational, performative and passes down knowledge.

To reduce songlines to a system of wayfinding and navigation simplifies what songlines are. They are something that I, as a non-Indigenous person, can only just begin to understand when listening, reading and watching guidance from Aboriginal researchers, designers, artists and authors. In this Acknowledgement to songlines I am quoting only Aboriginal authors and designers; they are: author Bruce Pascoe (Bunurong), author Alexis Wright (Waanji) and scholar and spatial designer Danièle Hromek (Budawang/Yuin).

> Songlines link sites to people, landscape and ecosystems, to sky, water and languages. They connect Countrys and groups, creating lines of knowing, interchange and movement, often across vast distances. (Hromek, 2019, p.81)

As I am a non-Indigenous researcher, songlines are not my story to tell or my area to research and I prefer to learn and contribute to the area of cultural storytelling in wayfinding post-PhD collaboratively and under the guidance of Indigenous-led research projects. I would therefore like to acknowledge that any form of wayfinding I am experimenting with here will not come close to the intricate, cultural, spiritual and political connection songlines have to this place, Australia, that has never ceded sovereignty and I would also like to acknowledge that songlines show us that wayfinding can be intricately connected to story.
As I am a non-Indigenous person, this research is also acknowledging that we are all always “On Country”, and with this research I am on Gadigal Country, here in the concrete and tar-sealed centre of the central business district (CBD), in the heart of the city of Sydney.

ABSTRACT

Type Trails: Exploring the potential of typography as a system for storytelling in urban wayfinding design

This research proposes that a storytelling approach to urban wayfinding design opens up an opportunity to critically examine existing wayfinding design systems based on ecological, cultural and historical information and inform the wayfinding experience in a city. Urban wayfinding design plays an integral role in making cities legible, connected, accessible and functional. Navigational technologies and digital wayfinding have produced new methods to navigate and experience cities that impact new wayfinding systems design.

Digital technologies extend opportunities for immersive and experiential approaches to narrative strategies of wayfinding design. This research poses the questions:

1. how might a storytelling approach to urban wayfinding design be a critical probe?
2. how might we design local wayfinding systems for cities that provide a deeper and richer orientation to place?

The research initiates a critical enquiry into existing wayfinding design mechanisms within the city centre of Sydney. It classifies the global, local and historical influences on Sydney's wayfinding systems and catalogues areas where a "local" identity could be developed from typographic and other perspectives.

Identifying the disjunct between articulating the ecological history of the area and contemporary digital wayfinding and physical signage led to the development of a prototype titled *Type Trails*, which forms the practice component of this PhD. *Type Trails* is a locative, immersive, digital, wayfinding experience that prompts users to consider the ecological and cultural history of inner-city Sydney and its influence on how we find our way. As a discursive object, it contributes to the possibilities of geospatial explorations using typography as a system for storytelling within digital mapping and it works in a non-linear format with different literary sources that converge, wayfind and drift through multiple layered stories that connect with physical signage in place.

TERMS

Digital Wayfinding

The act of finding your way and orientating oneself with the use of digital wayfinding technologies. Digital wayfinding in the urban environment encompasses a whole range of possibilities including: digital mapping systems (GIS) and GPS navigation in combination with location aware devices; applications or websites that are activated through QR codes; notifications on location-aware devices triggered by beacons or NFC/RFID tags in the environment; digital mobile storytelling experiences; and digital signage that is connected to personalised systems or other online social network connectivity. AR (augmented reality) can be built into most of these experiences.

Legible Sydney

Legible Sydney is a pedestrian wayfinding system in the city of Sydney which has been steadily rolled out across the suburbs that the City of Sydney Council govern. The wayfinding system was designed by Minale Tattersfield in partnership with the City of Sydney Council and is based on a larger global series of Legible wayfinding schemes, namely *Legible London*.

Mapbox

Mapbox is a mapping platform for location based services.

Navigation

'Some researchers differentiate navigation from wayfinding as the process of traveling along a pre-determined route such as established roads, routes, waterways or pathways.' (Golledge and Garling cited in Melzer & Madison, 2020). Ingold also describes the role of navigation as a "cognitive task" in which one follows a set of instructions to reach a set location that has geographical co-ordinates (Ingold, 2000, p. 236).

Typography

Historically, typography was a term specifically used to describe type design and typographic principles that derived from a mechanical process or had an element of a mechanical system at its base. According to Ellen Lupton, who as an academic researcher and educator has written extensively on the field of typography, "Typography is what language looks like" (Lupton, 2010). The role of the typographer emerged in the early 20th century, when independent designers started taking control of publication design and publishing from master printers (Kinross, 2004, p. 68). At its core, typography is infinite variations of an alphabet, a way of visualising language and an investigation into verbal and visual relationships; it is visible language.

Wayfinding

Wayfinding is a performative act of finding your way and orientating oneself in an environment. Lynch defines wayfinding as "the consistent use and organisation of definite sensory cues from the external environment" (Lynch, 1960, p. 3). Taking this further, Ingold describes wayfinding as a performative act over time and place in which wayfinders gain their knowledge of place or pathways "as they go" and that "people's knowledge of the environment undergoes continuous formation in the very course of their moving about in it" (Ingold, 2000, p. 230).

Wayshowing

Passini argues that the area of wayfinding in which visual communication design can play a significant role is "the execution of plans and the transformation of decisions into behavioral actions." (1981, p. 17). Mollerup coined the product of this practice as "wayshowing", "the professional activity of planning and implementing orientation systems in buildings and outdoor areas" that "precedes and enables wayfinding" (2013, p. 6). Wayshowing is made up not only from wayfinding design or urban design but by architectural, urban and natural devices in the environment (Mollerup, 2005).

Wayfinding as storytelling

Ingold positions the role of wayfinding as more akin to storytelling, because "places do not have locations but histories" (2000, p. 219) and comes to this position through his research into many Indigenous forms of wayfinding and through the influence of an ecological approach to the perception of the environment by James Gibson (1979). Danièle Hromek, explains how from an Aboriginal perspective, storytelling, mapping and walking Country are deeply entwined:

> Mapping Country through walking creates a map of the lived experience of places, in a way, a true knowledge of place. Mapping lived experience enables a knowing of places through the senses, which interact with our emotions; it is an embodied learning of the relational narratives of that place through space and time. Navigating using Country as a means for movement embeds encountered stories into made objects. The route "drawn" into the landscape links, and at times follows, the narratives of places; this is meaningful movement that not only retells stories but writes them anew. (Hromek, 2019, pp. 196–7)

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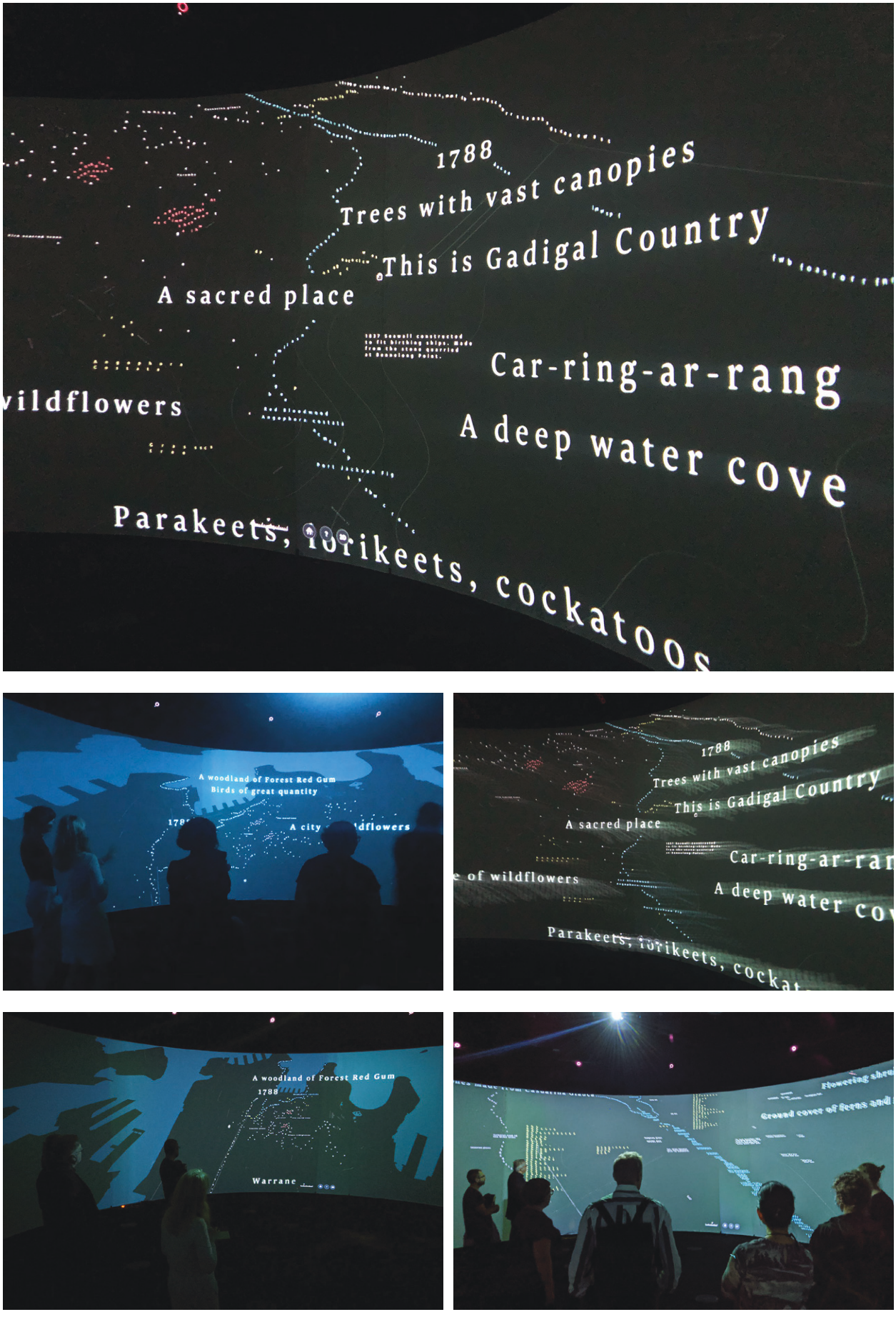


Photos: Nicky Hardcastle and Ben Simons

▲ FIGURE 1
Prototype exhibited in a small exhibition in the Data Arena at the University of Technology.

CHAPTER 1

Introduction

Start with a hunch or an urge or some curiosity. It's auspicious if you're thrilled about this urge, even if you can't yet account for it. Refine your fuzzy investigative sense during a generous amount of "mulling time." Savour the allure of the mystery. Over the full duration of your research, your comprehension and feelings get progressively blurred, but you are permitted to start disoriented, mystified, wonder-struck or even stupid. (Gibson, R, 2018, p. 19)

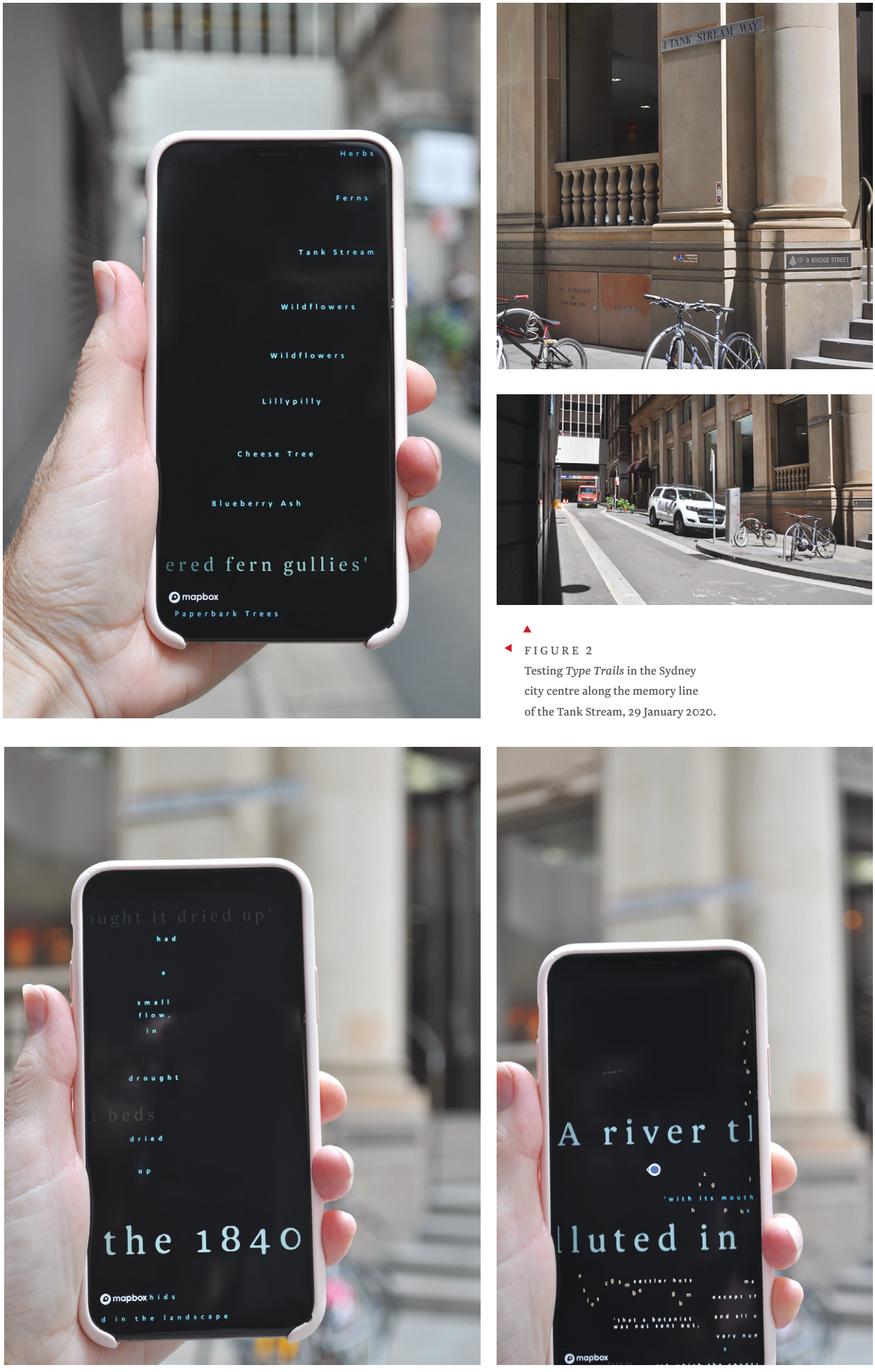


FIGURE 2
Testing *Type Trails* in the Sydney city centre along the memory line of the Tank Stream, 29 January 2020.

INTRODUCTION

Imagine walking along George Street on your daily travels, along Sydney's main urban street, which is currently looking unnaturally bright and sparkly with its new grey tiles that have not yet been scarred with the footprints of many feet. The new light rail, magnificently shiny, is passing by and around you its new platforms with their digital signage communicate the timetable. Here the present and the not-too-distant past, when Sydney had the largest network of trams in the southern hemisphere, converge. Imagine that you notice some letterforms and words embedded in the new grey tiles under your feet, that these letters and words join in places to make pathways of words, some forming sentences which invite you to walk along to experience them, and the sentences remind you that this path has been here for thousands of years, as a pathway of trade. Imagine that these typographic markers in the environment also invite you to trigger an app on your location-based device, an immersive typographic map that starts to flicker kinetically through pathways of letterforms into fluid layers of words which move and twist and start to tell a story about this street, to get you lost in the past for a while to see the convergences with the present, to re-think about why these main roads are where they are.

> It is thought that some of Sydney's main thoroughfares, such as George Street, Oxford Street and King Street in Newtown, followed Aboriginal tracks that had served as trading routes between farmed grasslands or bountiful fishing areas. (City of Sydney's Barani website cited in Daniel, 2018)

In another scenario, imagine that you enter an exhibition in a Sydney museum and find a virtual map as a large touchscreen that you recognise as a map of Sydney. You are invited to participate in this touchscreen exhibit and as you start to move the digital map, it unfolds into layers of type, paragraphs and words. You follow a blue trail of letterforms and as you do so, the letterforms flicker; as you zoom further, this moves into words that link to describe a stream that once had fresh water but is now buried deep underneath this city as a stormwater channel[1].

1 The Tank Stream is still a storm-water channel which runs under the city from the lower part of the city centre out into the harbour. (Sydney Water, 2004)

> Today it runs silently through arched stone culverts under the city streets. (Karskens, 2009, p. 250)

When the research is focused on the practice-based components, the writing remains mostly in the first person, to make explicit the research through design process – to aid in describing and unfolding this practice. In the contextual review, which largely explores work undertaken by others, it moves into the third person to separate this from the practice-based research.

Overview: *Type Trails*—the prototype

The practice-based component of this research, *Type Trails*, aims to communicate the "hidden logic" (Gibson, 2009, p.44) of the way we find our way around the city centre of Sydney based on historical, ecological and cultural information. It follows the invisible memory lines of the original coastline of Sydney, the Tank Stream and the original Aboriginal trade pathway of George Street[2] to tell a story of this area, with a primary focus on the flora, particularly the trees, and on what lies underneath, thus revealing the very beginnings of Sydney's city plans and through this, the reasons for the ways in which we currently find our way in this area. This is experienced through words (typography) contained in the prototype, a typographical map which is the interface for a digital wayfinding experience.

Type Trails is also an investigation into the geospatial possibilities of using typography as a system for storytelling within digital mapping and a contribution to the field of wayfinding design from a visual communication design perspective on how digital wayfinding can operate as both an immersive storytelling experience and a discursive object.

Type Trails was built using the geographical information systems (GIS) software *Mapbox* and the storytelling exists as longitudinal and latitudinal data that can be displayed on any platform. It responds to elements within the site-specific area of inner-city Sydney and could be triggered by graphic design markers. It also operates as a wayfinding experience and has the potential to be developed into an exhibition piece to be experienced virtually.

This prototype is not intended to be scientifically or geographically accurate. In fact, such accuracy is not possible, as the historical data on pollen and geographic co-ordinates is fairly speculative, based as they are on the lack of pollen readings from this urban centre, on old maps that were hand drawn and lack important geographic information and on tree growth patterns that cannot be completely accurate as their historical references are circumspect[3]. I have therefore reframed the space into one that is experimental, placing the information from the colonial maps of the area over a GIS map to be as accurate as possible. I have also used data from the Significant Tree Register[4] and data and research on pollen readings in the area. The result is a memory of a landscape, plotted over the actual one. The person experiencing this moves around the city based on what trees were here and what environmental and ecological aspects have lain underneath in the landscape, a memory of landscape experienced through typographic content.

In creating this prototype, I explored different ways of reading text in digital mapping by exploring typographic "structural relationships" (Drucker, 2013). This included different ways of adding a dimensionality to the experience through exploring the affordances of *Mapbox*, in particular, its fluidity and zoom functions; different ways of converging with signage in place (through locating information in existing signage and environmental graphics and place-making) and different ways of wayfinding digitally through typographic information that generously engages various literal sources.

2 Jakelin Troy is a Ngarigu woman whose Country is the Snowy Mountains of NSW. Troy mentions in the ABC article 'Walking in their tracks': How Sydney's Aboriginal paths shaped the city' (Daniel, 2018) that George Street was once an Aboriginal pathway.

3 In the archaeological paper: 'The Soil and Pollen Analysis of part of the Gardens of First Government House, Sydney' Australian Historical Archaeology, 6, 49–56., the authors state that 'Not only are undisturbed soil profiles extremely rare in the City of Sydney, but the existence of one sealed from later contamination must also be unique' (p. 51). Doug Benson and Jocelyn Howell in their 1990 book Taken for Granted, the Bushland of Sydney and its Suburbs, refer to the bio-diversity in their map and research of this area as 'likely vegetation' and comment that 'no details of the original vegetation have survived', they list what was likely to have grown in this area based on what 'the soils and topography indicate' (p42).

4 The City of Sydney Significant Trees Register is a map and list of Sydney's significant trees within the City of Sydney Council area, both native and introduced, and helps to protect and maintain them. The trees contained in this list were put forward by the local community and then assessed according to a classification criteria 'by landscape and heritage experts'. (City of Sydney, n.d., para. 4)

According to visual communication design scholar Teal Triggs, we are "readers of the city", scanning the environment for ways to "make sense of information" and ways that orient us "to the spaces we inhabit" (2009, p. 245). Brokering a practice that uses typography to visualise, materialise and communicate narratives and information also presents an alternative to ways of reading information within a city.

Research aims and questions

The aim of this research is to present ways in which a storytelling approach to urban wayfinding design can critically examine wayfinding design systems based on ecological, cultural and historical information and inform the wayfinding experience in a city.

The research argues that the field of urban wayfinding design needs to shift its emphasis from a predominantly problem-solving process to include a storytelling approach that centres on a city's ecological origins, landscape features and cultural history. This will enhance the environmental perception involved in a wayfinding process to a more local understanding of place, an alternative to addressing largely "the organization of the space and the circulation system" (Passini, 2002, p. 98) based on "patterns of movement" (Gibson, 2009, p.44).

The practice-based outcome, *Type Trails*, was developed after identifying the disjunct between the ecological history of the area and its contemporary wayfinding and physical signage. *Type Trails* aims to be both a locative, immersive experience that people can use and a discursive object that opens up questions about urban wayfinding design and storytelling. The research poses the questions:

1. how might a storytelling approach to urban wayfinding design be a critical probe?
2. how might we design local wayfinding systems for cities that provide a deeper and richer orientation to place?

How the research is structured

CONTEXTUAL REVIEW & SURVEY

AN INVESTIGATION OF WHAT IS

RE-IMAGINING URBAN WAYFINDING

PRACTICE SHOWING WHAT COULD BE ...

This research is structured as a critique of what is currently in place as wayfinding design in the Sydney city centre. It aims to make existing structures and systems of wayfinding explicit and then forms a practice component around what could be in place. It draws on the work of media studies scholar Shannon Mattern who discusses how media materialities shape and frame the spaces we inhabit and engage in. In her 2014 article, "Interfacing Urban Intelligence", she puts out a provocation to

designers who work with data, cities and interfaces to research what is currently in place and intended for the future and to "illuminate what is possible technologically, aesthetically and ideologically" (Mattern, 2014, para. 9)

Using this as a guide, I split the research into two sections, the first being an interrogation of "what is" through the contextual review and survey and the second being a reimagining of urban wayfinding, "what could be", through a practice-based process.

I also draw on design scholar Ramia Mazé's framework for different modes of criticality in design practice (2009). The first mode is that I critique my own practice in order to develop my work through a reflective inquiry, a form of reflection which contextualises or recontextualises (2009, p. 389) my wayfinding design practice (from a visual communication design background) using tools, processes, methods and "modes of production" of my discipline or practice. (2009, p. 387) The second mode is critiquing my own discipline in order to extend it or to build a "disciplinary discourse" (2009, p. 391), a critical probe into what urban wayfinding design can become. The third mode is looking beyond my own discipline, using design practice to critique "pressing issues in society". (2009 p. 395). The way in which this research considers orienting and wayfinding through ecological information in order to relate to place also communicates a greater cultural and ecological dialogue about endangered vegetation and lost streams in Sydney. I used a research-through-design (RTD) methodological framework explored through a critical documentation process, which is discussed in Chapter 2.

This research also includes a contextual review of scholarly writing, practice precedents and a contextual survey, for the last of which I use methods of observation, photo-documentation and graphic analysis.

Theoretical framing

WAYFINDING DESIGN

The field of practice for this research is urban wayfinding design, which is investigated from a visual communication design perspective while incorporating theory from the digital humanities, media studies, geography and urban design. This practice-based research is specific to the Sydney city centre and focuses on the pedestrian experience in the public built environment, leaving out all the private spaces and traffic signs and systems.

Wayfinding design research traditionally sits within the fields of architecture, urban design/planning and visual communication design (see Arthur & Passini, 1992; Berger, 2005; Gibson, 2009; Jeffrey, 2017; Lynch, 1960; Mollerup, 2005, 2013; R. Passini, 1981, 2002) Contemporary wayfinding design research has diversified and now branches across many disciplines, largely due to the advent of digital wayfinding, digital mapping and emerging technologies; these disciplines include but are not limited to geography, industrial design, information technology, engineering and digital media.

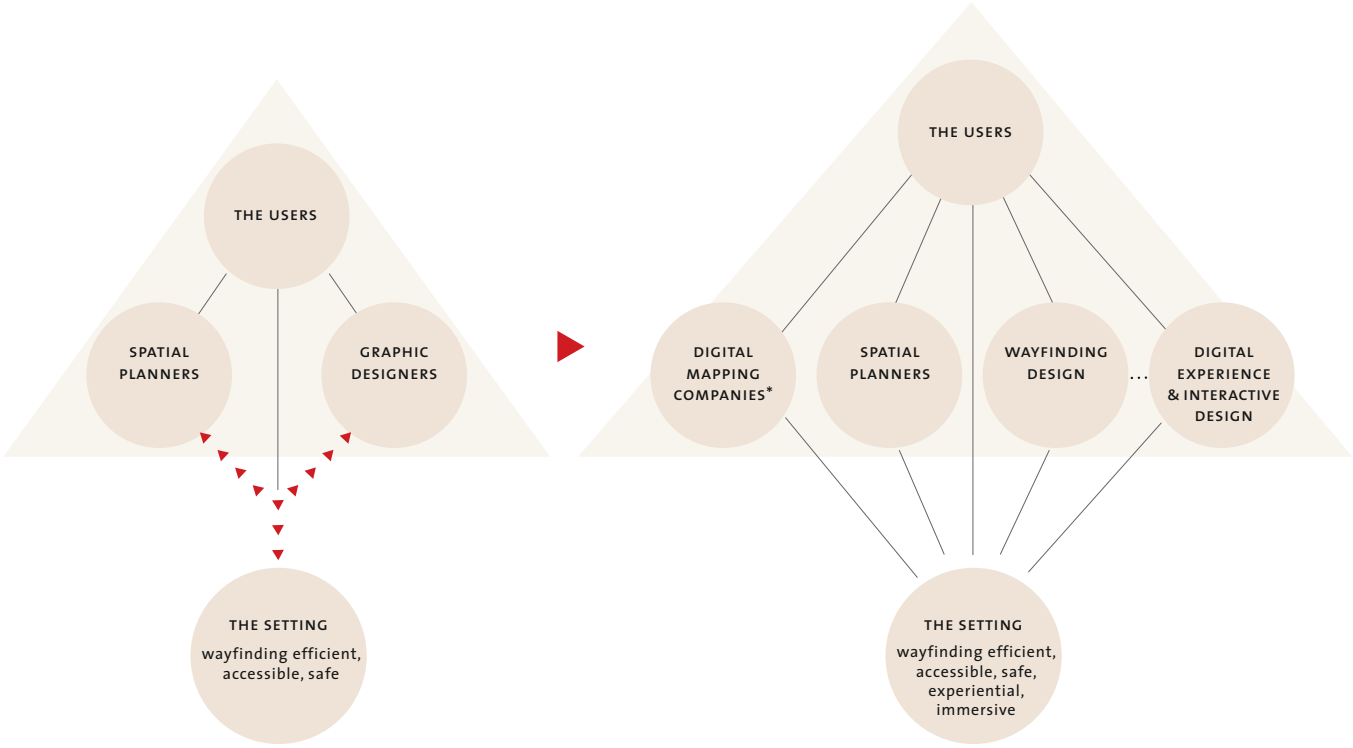
THE WAYFINDING PYRAMID

Re-illustrating 'The wayfinding pyramid' by Paul Arthur and Romedi Passini (1992, pg. 53) and visualising their process.

THE CHANGING FIELD OF WAYFINDING DESIGN

as outlined by the author

By creating visualisations I am attempting to understand the field of study in each theorist's work and what underpins their definition of wayfinding.



* Digital mapping companies such as:
Google (Google maps), Apple (Apple maps), OpenStreetMap Foundation (OpenStreetMap), Esri (ArcGIS), Mapbox (Mapbox)

FIGURE 3
The changing field of wayfinding design.

The primary role of urban wayfinding design is largely understood as helping people to find their way around a city and is widely researched and defined as a spatial problem-solving process that shapes behaviour in cities (Arthur & Passini, 1992; Berger, 2005; Mollerup, 2005). City wayfinding schemes are based on the concept of the "image" or "legibility" of the city (Lynch, 1960) and a series of decision-making points that direct behaviour to reach a destination (Passini, 1981) highlighting or following key landmarks en route. However, wayfinding is also considered a social, cultural and historical narrative over time and distance (Heft, 2013). Harry Heft, a psychology and environmental studies scholar, argues that "the navigational and orientation practices and knowledge that exist within any culture are contingent on the environmental character of local conditions and on the sociocultural history of the culture." (Heft, 2013, p. 22) Heft's research is integral in positioning wayfinding into the socio-cultural domain.

In addition, this research acknowledges the contribution to the field of wayfinding research from an Indigenous perspective. Scholars Fetaui Iosefo, Anne Harris and Stacy Holman Jones, in *Wayfinding as Pacifika, Indigenous and critical ethnographic knowledge* (2020), discuss how wayfinding is a cultural story about place and journey that evolves over time and through movement and is "defined not just by the individual's pedagogical experience 'within an environment', but rather by the generations of knowledge shared and passed down." (Iosefo et al., 2020, p. 17)

Almost 20 years after Paul Arthur and Romedi Passini first argued in their 1992 book *Wayfinding: People, Signs, and Architecture* for wayfinding design as a valid area of study, there is a need for wayfinding principles to be updated to reflect the new ways in which pedestrians navigate themselves around cities, thanks to digital wayfinding.

FIGURE 4
The zone of activity in wayfinding design practice in Australia.

* An example of the main practices working in this space but acknowleging there are others working in this space.

THE ZONE OF ACTIVITY IN WAYFINDING DESIGN PRACTICE IN AUSTRALIA

The applied field of wayfinding design is interdisciplinary and multidisciplinary. With the emergence of digital technologies, global positioning systems (GPS) navigation systems, digital mapping through GIS, location-aware devices and digital signage, the field has now diversified and emerged as a profession with a considerable amount of design practices working in this space in Australia. Wayfinding design sits within the field that the Society of Experiential Graphic Design (SEGD) terms "experiential graphic design". The SEGD is the global organisation for this community of practice, promoting applied and academic research, conferences and seminars and producing industry-based global awards. Previously named the Society of Environmental Graphic Design, the SEGD currently defines experiential graphic design as follows:

> Experiential graphic design involves the orchestration of typography, color, imagery, form, technology and, especially, content to create environments that communicate.
>
> Examples of experiential graphic design include wayfinding systems, architectural graphics, signage and sign programs, exhibit design, retail design, and themed or branded spaces. Increasingly, experiential graphic design involves the use of digital technologies and systems that present dynamic content through motion graphics and make possible rich interactions between a user in a place and the information being provided. (Dixon, 2014, para. 1 & 2)

In Australia (see Figure 4), wayfinding design is split among architectural and design practices, with combinations of urban designers, architects, visual communication designers, industrial designers, engineers, digital designers and programmers and more. Many architecture firms have in-house wayfinding teams and a number of urban design companies have similar capabilities to the visual communication design practices but also offer urban planning and strategy. Australian practices working in the space defined by the SEGD as experiential graphic design tend to offer capabilities in many or any of the following categories: wayfinding design and systems; branded environments; digital and physical signage; retail and exhibition design; placemaking and identity; environmental graphic design and public installation; digital experience and interactive design; interpretation signage and strategies, strategy planning and research. Outlining this applied practice framework establishes the complexity of this relatively new professional field in Australia and how wayfinding design fits within it. The practice-based component of my research works within a few of these spaces – interpretation, wayfinding design, digital interaction and experiential design.

USING TYPOGRAPHY AS A DEVICE TO VISUALISE AND MATERIALISE STORIES ABOUT A CITY

Historically, typographers have been integral to the success of city-based large-scale signage and wayfinding projects. Such typographers include Edward Johnston for the London Underground signage system, Adrian Frutiger as part of the architecture team for the Charles de Gaulle Airport signage, Jock Kinnear and Margaret Calvert for the British road signage system and, more recently, Michael Beirut and Pentagram playing a key role in WalkNYC.

The contextual review for this research first draws on RG Harland, a visual communication and environmental graphic designer and scholar who, referring to Lynch's research in *The Image of the City* (1960), examines the role of typography as an urban graphic object, its contribution to the image of a city's built environment and how typography contributes to making a city, place or country legible. Global and local graphic systems for pedestrian and transport wayfinding "shapes our behaviour in cities" (Harland, 2015, p. 370) persuading, controlling or informing our movement from arrival to departure. Harland argues that typeface design and typographic consideration are integral to the functioning of a city: "... how the design of a typeface, how it is arranged, how it integrates with other devices such as an arrow or a map, contributes to the functioning – or malfunctioning – of a city." (Harland, 2016, p. 4). Harland takes this further, saying:

> Graphic intervention through the coded combination and application of vivid visual devices as meaningful mediated communication shapes behaviour in cities and is increasingly relied on to do so. However, there is little consensus about how this phenomenon is discussed by those interested in associating graphic communication and the built environment. (Harland, 2015, p. 370)

This research aims to expand on this phenomenon and explore the possibilities of typography as a system for storytelling in the physical environment through digital wayfinding, something which Harland does not explore. Also, unlike Harland, this research positions itself within the framework of wayfinding design and is not attempting to make a case for this within urban design theory.

Second, this research also draws on a practical and theoretical framework from scholar, artist and writer Johanna Drucker, who argues that visible language (across all platforms: digital, print and signage) operates "in producing a navigational system as well as meaning" (Drucker, 2013, p. 99). Drucker also states that at its alphabetical base, through context and place, we are able to distinguish genre and typologies before content. (Drucker, 2013):

> By reading stylistic codes, the place and situated-ness of an inscription that distinguishes formal monumental writing, informal graffiti, printed communication, official signage from each other and from other modes of writing, we are able to identify orders, genres, types of written language in a millisecond, long in advance of processing textual content. (Drucker, 2013, p. 91)

Third, this research draws on media studies scholar Shannon Mattern who discusses how media materialities shape and frame the spaces we inhabit and engage in. She discusses how emergent technologies (location aware devices, sensors, satelites, cameras, audio recorders, beacons, data infrastructure and mapping) can be used to make the immaterial infrastructures visible, so the users of the city can tune their environment, engage and interrogate the city and affect how people move around, inhabit and experience place. (2013, 2014b, 2017). Mattern argues that "urban designers, planners and scholars ... have been asking the big questions for centuries: How do cities function and how can they function better?" (Mattern, 2017, para. 2).

Significance

CITY COUNCILS, STATE GOVERNMENTS AND MUSEUMS

This research has the potential to be of significance to local and state governments that have an interest in communicating and integrating the ecological, historical and cultural narratives through wayfinding experiences into the environment. My experience of working on an Indigenous-led Indigenous interpretation strategy for the Gunyama Park Aquatic and Recreational Centre for the City of Sydney Council made me acutely aware that local councils are keen to embed storytelling into their centres, walkways and parklands and are looking for ways to do this. My work with the same council on a wayfinding student partnership for a Sydney city harbour walk has highlighted to me that councils and governments are also interested in how a digital experience and physical signage can create wayfinding storytelling experiences in new, multi-layered and interpretive ways for pedestrian walkways.

The SEGD positions wayfinding as the primary consideration for people's experience of place: "Wayfinding is at the core of a visitors experience of place" (SEGD, n.d., para. 4). It argues that experiential graphic design has moved from the traditional fields of wayfinding and signage design into placemaking (SEGD, n.d., para. 7). In relation to changing approaches to wayfinding and signage design, game designer and scholar Ian Bogost makes the bold claim that precision-based mapping for driverless cars could mean that street signs for traffic purposes will become a redundant form of infrastructure (Bogost, 2017). Adrienne LaFrance, the editor of *The Atlantic*, also proposes in her article "A future without street signs" (LaFrance, 2016) that all street signs will become relics of the past when mapping becomes more precise and wearable AR devices are widely adopted on a large scale.

The way users navigate in the urban environment has been notably altered by digital wayfinding (Garcia-sterling & Pitt, 2020; Park & Evans, 2018) and is "changing how we interact with our surroundings" (Park & Evans, 2018, p. 276). Wayfinding designer and academic writer Colette Jeffrey[5], who has designed legible wayfinding systems for cities, sees a future with seamless integration between digital wayfinding and physical signage. She cites Per Mollerup (2014) and proposes that physical signage for wayfinding will not disappear due to the basic fact that not all users or travellers are always in possession of "a digital wayfinding assistant all the time" (Jeffrey, 2017, p. 523). Wayfinding design will likely increase in allowing personalised experiences in combination with global systems. (Garcia-sterling & Pitt, 2020) Building on this idea, Dan Hill (formerly of Arup) in his article "The city is my homescreen" (Hill, 2011) argues that the focus on user-experience design for a city-facing problem can create products and services that serve the need of individuals and not the needs of the city or public as a whole when a user-centred design approach is used. This provides an argument for keeping certain information at a public signage level.

Currently, physical street signage is becoming more digital and pedestrians are navigating themselves around cities in new ways. This means street signage is likely to change its role. What other role can this infrastructure play? This research puts forward concepts and speculative ideas for interpretive design approaches

5 Colette Jeffrey is an Associate Professor of Wayfinding and Inclusive Design at Birmingham City University and designed, produced and wrote the *Transport for London (2010). Legible London Inclusivity Report*.

that add local ecological and environmental information and storytelling to the ways pedestrians can orientate and wayfind in a city. Therefore, this research could be of interest to local councils and governments in addition to scholars of visual communication design, digital humanities and urban design.

PEDAGOGY AND INDUSTRY ENGAGEMENT

Since 2018, I have been in a partnership with Sydney Living Museums and for a year before that with the City of Sydney Council on wayfinding projects for my students. These projects focus on wayfinding through historical and cultural storytelling related to significant sites and places, the ways that visitors have access to the important stories of each site and how the stories could be effectively and creatively interpreted, communicated and shared through physical signage and digital wayfinding aimed at a general public audience. The students in my class produced outcomes in the form of prototypes for mobile wayfinding applications, proposed digital signage, booklets, posters, environmentally conscious signage, embedded ground graphics or markers and interpretive installations. A central concern of this brief is imagining the lives of the people who inhabited these places/spaces in the past and then investigating ways this could be visually communicated and interpreted through physical signage and digital wayfinding. Each year a student showcase of the best work has been co-ordinated and presented to the curatorial and design staff at Sydney Living Museums.[6] This area of research is therefore relevant not only to pedagogy but also to industry.

DIGITAL MAPPING COMPANIES (GIS)

This research would potentially be of interest to digital mapping companies, as it uncovers and points towards the potential for digital wayfinding to enable new ways of experiencing place different from those experiences expected of digital mapping.

It could also be of interest to these companies, such as Esri, who already have a vested interest in storymaps[7] but, as yet, not in how typography specifically could be used as a system for storytelling as a part of wayfinding design. Similarly, it could be of interest to companies like Arup that use prototypes as a method in their work for smart cities.

This research would also be of interest to organisations such as the SEGD, the Sign Research Foundation and the International Sign Association as it offers provocations in this field that could contribute towards further research.

6 Students from these projects have found jobs in this area of wayfinding and environmental graphic design. The student outcomes from these projects have also won industry awards (the International Society of Experiential Graphic Design, SEGD Awards 2018, https://segd.org/manon-drielsma-the-sydney-foreshore-story-line, https://segd.org/sydney-foreshore-story-line, the Australian Graphic Design Awards 2019, 2020 (student digital) and the NZ Best Awards (student digital).

7 Storymaps are a way of creating online content or a website that includes mapping or a geo-located story. https://storymaps.arcgis.com/

Chapter Breakdown

Chapter 2
Methodological Approach

This chapter outlines the methodological framing of this research, using a research-through-design (RTD) methodology. It gives an overview of the critical documentation process in this research, making sense of how I mapped out my field of research through progressive overview maps that helped formulate the research; how I used diagrams as a method; how I used a prototype as an immersive experience and a discursive object and how and why the research questions emerged through the practice.

Chapter 3
Contextual Review

SECTION 1: URBAN WAYFINDING DESIGN

This section provides the theoretical underpinning of the critical analysis and practice-based research and introduces the field of urban wayfinding design. The section positions a theoretical framework for the research and establishes what urban wayfinding design is in relation to its historical and theoretical context and as an applied practice. It also discusses where wayfinding design is located and what types of functions it has in our cities. The section then examines the way storytelling contributes to the types of urban wayfinding experiences that cities offer.

SECTION 2: DIGITAL WAYFINDING

Providing a comparative analysis of the digital and the physical in urban wayfinding in a global and local context, this section examines new ways to navigate cities using digital technologies and how this changes approaches to wayfinding design and wayfinding habits. It also examines the ways that storytelling can be incorporated into a wayfinding experience in the urban, public, built environment.

SECTION 3: TYPOGRAPHY IN URBAN WAYFINDING DESIGN

This section examines the role of typography in wayfinding design and its historical and global design context. It discusses the development of typefaces for integration into urban signage, architecture and wayfinding, how they have evolved and how they play a key role in a city's legibility, orientation and identity. It considers the relationship of typography to the cultural specificity of the inner-city Sydney and sets up a basis for the analytical enquiry.

Chapter 4
Contextual Survey: Sydney wayfinding

This chapter is an analytical enquiry in the form of photo-documentation and graphic analysis as a way of investigating and disseminating information and ideas in relation to urban wayfinding in the Sydney city centre. These practice-based methods

were adapted from researchers and practitioners Phil Baines and Catherine Dixon and researcher, practitioner and editor Herbert Spencer. The outcomes of this analysis were then used to inform the practice. A list of categories of urban wayfinding design was created, together with an analysis of how the typography and design related to local identity. The outcome of the analysis also provided a basis for investigating how digital wayfinding could integrate better with physical wayfinding and what the relationships between them could be, based on the findings that there was little relationship between digital and static wayfinding. It also created an argument for wayfinding design that explored the ecological and cultural heritage of this area.

Chapter 5
Preliminary experiments on typographic systems for wayfinding

The suite of experiments were early exercises in prototyping a storytelling approach that could be introduced into existing wayfinding systems within the area and how this approach could also become a critique of existing systems. This chapter proposes speculative design projects set up as methods of inquiry: digital street name signage and indicators of air quality as digital signage. This practice-based research was an iterative process of working through three concepts for wayfinding design possibilities for this area based on cultural, historical, environmental and ecological information. The iterative process then informed the design of the prototype.

Chapter 6
Type Trails

In this chapter I draw on an ecological approach to wayfinding theory to inform my wayfinding design practice, which was a process of investigating and reflecting through critical documentation. It describes how I gained insights through my practice, diagramming and tracing and the typographic methods used. Throughout the practice I posed the following questions: How might a typographic wayfinding system work within a GIS map to tell narrative? How kinetic can I make the experience using the affordances of the mapping software, *Mapbox*? How can I find poetic ways of pushing through content that is largely not poetic? How can I strip the digital map away so that it does not look like a cartographic layout?

Chapter 7
Conclusion

In the conclusion I discuss this research as a criticism from within wayfinding design practice and potential directions for further research projects and collaboration.

CHAPTER 2

Methodological Approach

FIGURE 5
Process of the research.

METHODOLOGICAL APPROACH

Research through design has been used for more than 20 years by an international community of practitioner researchers "to describe practice-based inquiry that generates transferable knowledge" (Durrant et al., 2017, p. 3). Throughout this research, I used RTD for my research process of using design practice as a mode of scholarly inquiry explored through a critical documentation process. This enabled me to demonstrate how the particular methods and processes evolved through an iterative practice–each experiment led to a new idea, experiment or process–and how this led to insights that "generated transferable knowledge" (Durrant et al., 2017, p. 3; Sadokierski, 2020). The critical documentation practice also allowed me to show how precedents or scholarly articles informed my thinking or making. Therefore, the structure of my writing in this thesis is not a traditional linear research investigation but is a non-linear, reiterative and somewhat repetitious narrative following the Research through Design iterative process.

Critical documentation

Critical documentation is a form of journaling or diarising to capture an iterative process, to show where insights from making and doing emerge and to relate them back to literature from the contextual review and practice precedents (Sadokierski, 2020). Artists and scholars Maarit Mäkelä and Nithikul Nimkulrat, who discuss documentation for practice-based research in their 2018 article, "Documentation as a practice-led research tool for reflection on experiential knowledge", argue that "Any means of documentation, for example, diary writing, photographing or sketching can serve as a mode of reflection" (2018, p. 1). Different types of documentation were integrated into this document: photographic and graphic analysis, diagrams, charts, diary writing, tracing. Through this critical documentation, I wrote about the process, the complexity, the nuance and the insights of the practice in an iterative and exploratory approach that was a "tool" to draw out the "reflection on experiential knowledge" (Mäkelä & Nimkulrat, 2018, p. 1). This was based on Sadokierski's 2020 guidelines on critical documentation[8], as demonstrated in Chapter 6. Critical documentation enabled me to show how the particular methods and processes evolved through the iterative practice in which each experiment led to a new idea, experiment or process. This document combines pages of the critical documentation or research "diary" with the research "report" (Frayling, 1993, p. 5). In that article, "Research in Art and Design", Frayling describes this process of journaling and diarising as:

> action-research – where a research diary tells, in a step-by-step way, of a practical experiment in the studios, and the resulting report aims to contextualise it. Both the diary and the report are there to *communicate the results*, which is what separates *research* from the gathering of reference materials. (Frayling, 1993, p. 5)

8 Sadokierski's 2020 guidelines on critical documentation provided a structured framework to work within. The methods and processes also draw on the work of Mäkelä & Nimkulrat, 2018; Lambert & Speed, 2017; and Grocott 2010.

RESEARCH QUESTIONS EMERGED THROUGH THE PRACTICE

An important aspect of RTD is recognising that research questions can emerge through reflective practice (Lambert & Speed, 2017, p. 104; Sadokierski, 2020). Through critical documentation of my exploratory RTD practice, explained in more detail below, I documented questions, provocations or insights that emerged through reflection on each design experiment, which then contributed to the articulation of the main research questions. Equally, in RTD, methods can emerge through the practice of critical documentation, developed iteratively on previous experiments. Therefore, rather than writing a complete methods section up front, methods are discussed as they arose in each section of the thesis.

This iterative process has been more vital to the insights than creating fully-formed artefacts. In their article "Making as growth: Narratives in Materials and Process", Ian Lambert and Chris Speed say, "Increasingly, 'the doing' (the process) seemingly yields more new knowledge and insight than 'the done' (the outcome)," (Lambert & Speed, 2017, p. 105). The design work for this research was taken to the stage of a prototype, not to a final artefact.

> A designer makes things. Sometimes he makes the final product; more often, he makes a representation–a plan, program or image–of an artifact to be constructed by others. (Schön, 1995, p. 78)

THE PROTOTYPE

A prototype is a working format often used in applied design fields; partly it is a representation of a plan for an artefact and partly it is a research inquiry into a field of practice. In the case of *Type Trails*, on one hand it could be used as an immersive wayfinding experience to then be developed further into a variety of outcomes as it works across multiple platforms. With further development it could become an exhibition or an app that works as a wayfinding experience with physical signage. However, it has also functioned in this research as a discursive object for an inquiry into the geospatial possibilities of using typography as a system for storytelling within digital mapping, how it could converge with physical signage in place and how it could contribute to the field of wayfinding design.

Mapping out the field of research

At each stage in the research, I mapped my field of research, which I then returned to and interrogated as the research progressed. This moved through several stages while following the critical documentation guidelines developed by Sadokierski in her article "Developing critical documentation practices for design researchers" (2020). The following pages demonstrate the way I mapped my field of research, or what Sadokierski terms "progressive overview maps". This was my way of working through different mapping structures to understand the overall field of my study, to help formulate my research questions and main arguments and to structure, analyse, review and re-contextualise the research at key turning points or peer review sessions (Sadokierski, 2020).

Evidence of my internal dialogue is scattered throughout this document as pivotal insights from reflection, insights into the digital materiality or insights into the affordances and limitations of the software I was using. These fragments of insights or journaling/diarised notes were used to critically analyse my design process. They are demonstrations of reflections on my thinking-through-making. Here I drew on the creative practice of Lisa Grocott, whose 2010 doctoral thesis, "Design Research & Reflective Practice: The facility of design-oriented research to translate practitioner insights into new understandings of design", included key insights from her blog journal. What I learnt about the process of critical documentation is that often I found no pivotal moments until an experiment or prototype had reached a fairly completed stage in that particular enquiry. At that stage, it either opened up another question for a separate design enquiry, a provocation or an insight on that particular experiment. This dialogue-in-practice also made me aware that the tools of my visual communication design background in the area of publication design helped to structure and formulate my thinking, not only through diagrams but through tools to structure a page and navigate through a publication:

> *My reflection on the process of journaling at this point in time is that I am only describing when writing insights along the journey of creating work and it is not until each experiment is at a completed idea stage that I am able to critically analyse what I have learnt, or to gain any critical insights.*
>
> *I find I don't journal manually, I note take and make drawings, but the journaling functions better when I lay it out on the computer, which is a natural thing for me to do given all my past experience in publication design. It helps me to see hierarchies, to structure the information so that it communicates, to think about the navigation of the story of this research (this practice-based research). I am attempting also to make my process evident in the way I layout my research. The layout therefore contributes design-wise to the overall thinking behind the research, through becoming a tool of journaling it helps to formulate the thinking rather than just being a 'prettying up tool' at the end of the process. Not just a method to communicate the writing and the experimentation, it also structurally helps me in the 'making' of the work. This is done through the navigation of the layout (the order of the pages and the navigational devices around the page), the graphic hierarchies, the addition of inserted pages, the way in which I position the diagrammatics. This helps the meta narrative of the research.*
> *(Journal documentation, 17 Feb 2020)*

Sadokierski specifies that she does not want to direct the way designers critically document; rather, how practitioners capture and synthesise information through their own practice methods and devices should be open to them (Sadokierski, 2020). While some practitioners may use video or a blog to annotate throughout, I structured my critical documentation like a publication from my many years of working in publications design as that is how I think through the process (see examples in Chapter 6). The following are the types of progressive maps that helped formulate the research:

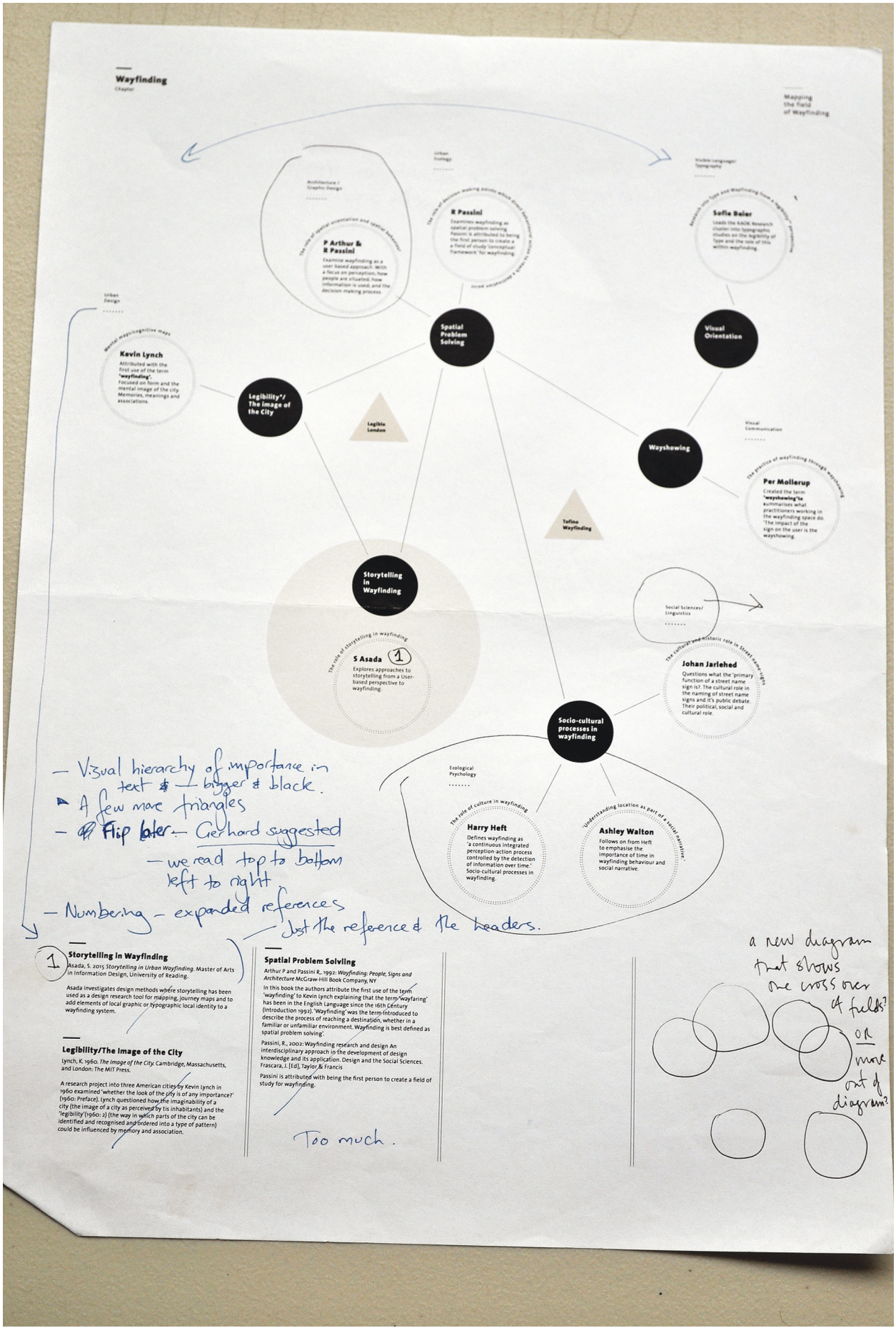


FIGURE 6
Annotated bibliography.

CONTEXTUAL REVIEW & SURVEY

AN INVESTIGATION OF WHAT IS

~~*TYPE TRAILS:* AN ANALYSIS OF TYPOGRAPHY WITHIN URBAN WAYFINDING IN THE PUBLIC BUILT ENVIRONMENT LEADING TO A RE-IMAGINING OF URBAN WAYFINDING~~

~~*TYPE TRAILS:* REIMAGINING URBAN WAYFINDING DESIGN A TYPOGRAPHIC APPROACH TO EXPAND THE NARRATIVE ASPECT OF WAYFINDING THROUGH THE RELATIONSHIP BETWEEN DIGITAL WAYFINDING AND PHYSICAL SIGNAGE.~~

~~*TYPE TRAILS:* REIMAGINING URBAN WAYFINDING DESIGN A TYPOGRAPHIC APPROACH TO EXPAND THE NARRATIVE ASPECT OF WAYFINDING~~

Introduction + chapter breakdown + significance + research questions + methodology

METHODOLOGY EMPHASISED

+ METHODS

Definition of urban wayfinding

Typography in wayfinding

Storytelling in wayfinding

CRITICAL FRAMING

Comparative analysis of the digital and the physical in urban wayfinding.

PERSONAL VS CITY-WIDE

Emergent technologies and how this changes approaches to wayfinding design

DEFINE NEW PRINCIPLES OF WAYFINDING

Indigenous approaches to wayfinding: Inuit, Polynesian, Aboriginal

INTERPRETIVE SIGNAGE

THE ROLE OF DATA

LAYERED STORYTELLING OPPORTUNITIES

PUBLIC AWARENESS SIGNAGE

RE-IMAGINING URBAN WAYFINDING

PRACTICE SHOWING WHAT COULD BE ...

Case study of the City of Sydney current wayfinding practice

EMPHASISE METHODS MORE

Photo document-ation of wayfinding systems

Street name sign analysis

Letterform analysis

CRITICAL FRAMING

Preliminary experiments

THIS INQUIRES - BRING THIS OUT MORE

Digital Street Name Signage

THIS INQUIRES - BRING THIS OUT MORE

Air Quality Signs

LAYERED STORYTELLING

Story poles

Larger project taken to prototype stage

FEED THIS INTO THIS

Type Trails

DEVELOPING

HOW DOES THIS INQUIRE?

EMPHASISE METHODS MORE

CRITICAL FRAMING

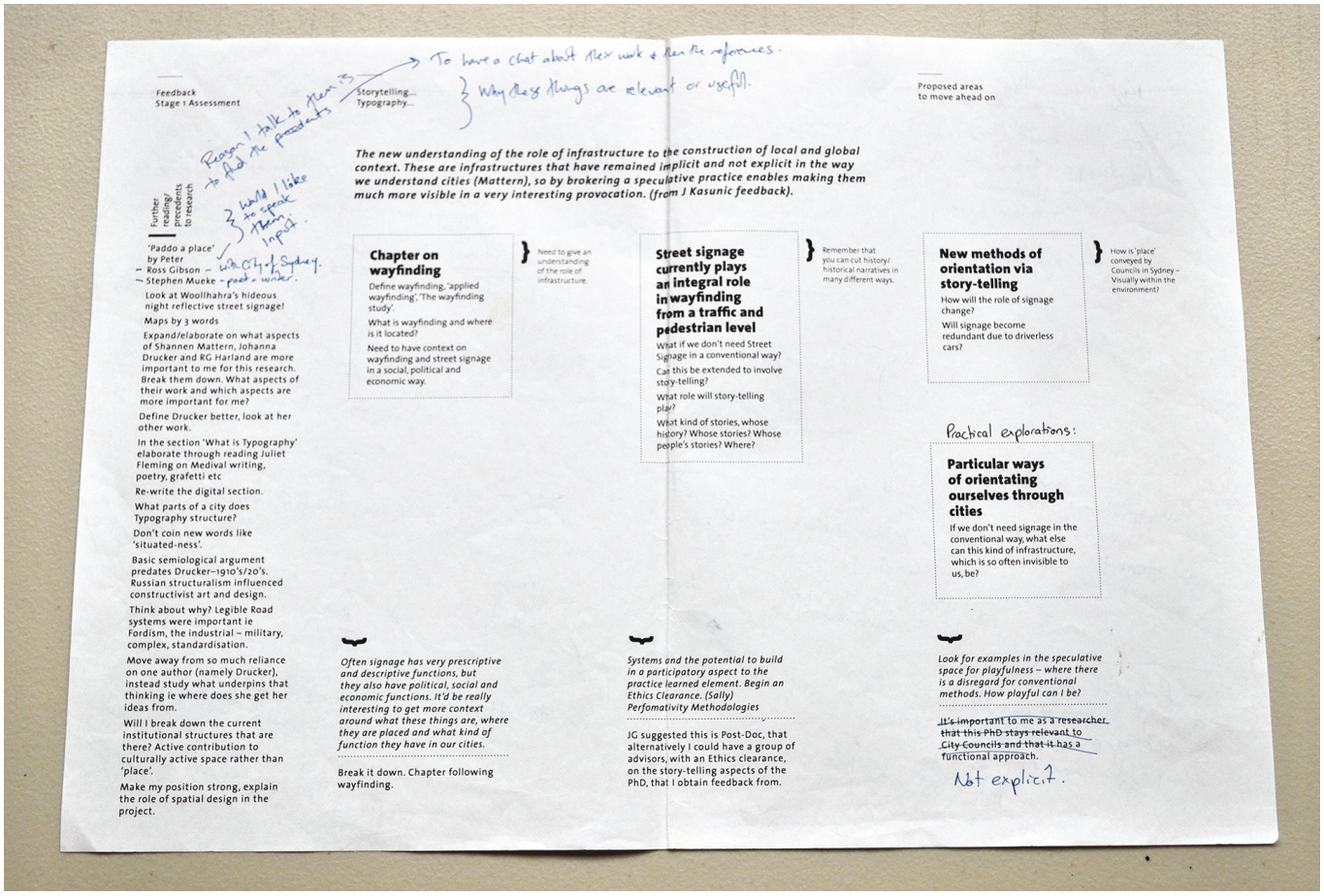
Conclusion

Bibliography

▲

FIGURE 7

Contents page as a diagram.



▲
FIGURE 8
Mapping out feedback.

ANNOTATED BIBLIOGRAPHY (FIGURE 6)

Initially I began with the research context, mapping out attempts at an annotated bibliography to delineate the field of wayfinding design for the contextual review and to focus on the theory within which the practice-based research would sit.

CONTENTS PAGE AS A DIAGRAM (FIGURE 7)

I used the contents page as a visual diagram to show the chapter breakdown and allow for an internal dialogue through the use of blue stickies. This was used in meetings with supervisors to discuss and formulate the research structure and main theoretical ideas. It was also a probe into areas where I had not inquired enough and a reminder to revisit them.

MAPPING OUT FEEDBACK (FIGURE 8)

After an assessment feedback session, I structured how I interpreted the feedback into a map to contextualise the significance and relevance of the research completed, how the research would move forward and which areas I would omit.

A BREAKDOWN OF THE PRACTICE-BASED COMPONENTS (FIGURE 9)

I formulated a breakdown of the practice to assess its relevance, how precedents influenced this work and how the different aspects of my design-practice, which could look quite disparate, related. This was reinterpreted later into the contents page diagram opposite (Figure 7) and was also used in feedback sessions to communicate the practice-based research component. This technique was used to help formulate the research questions.

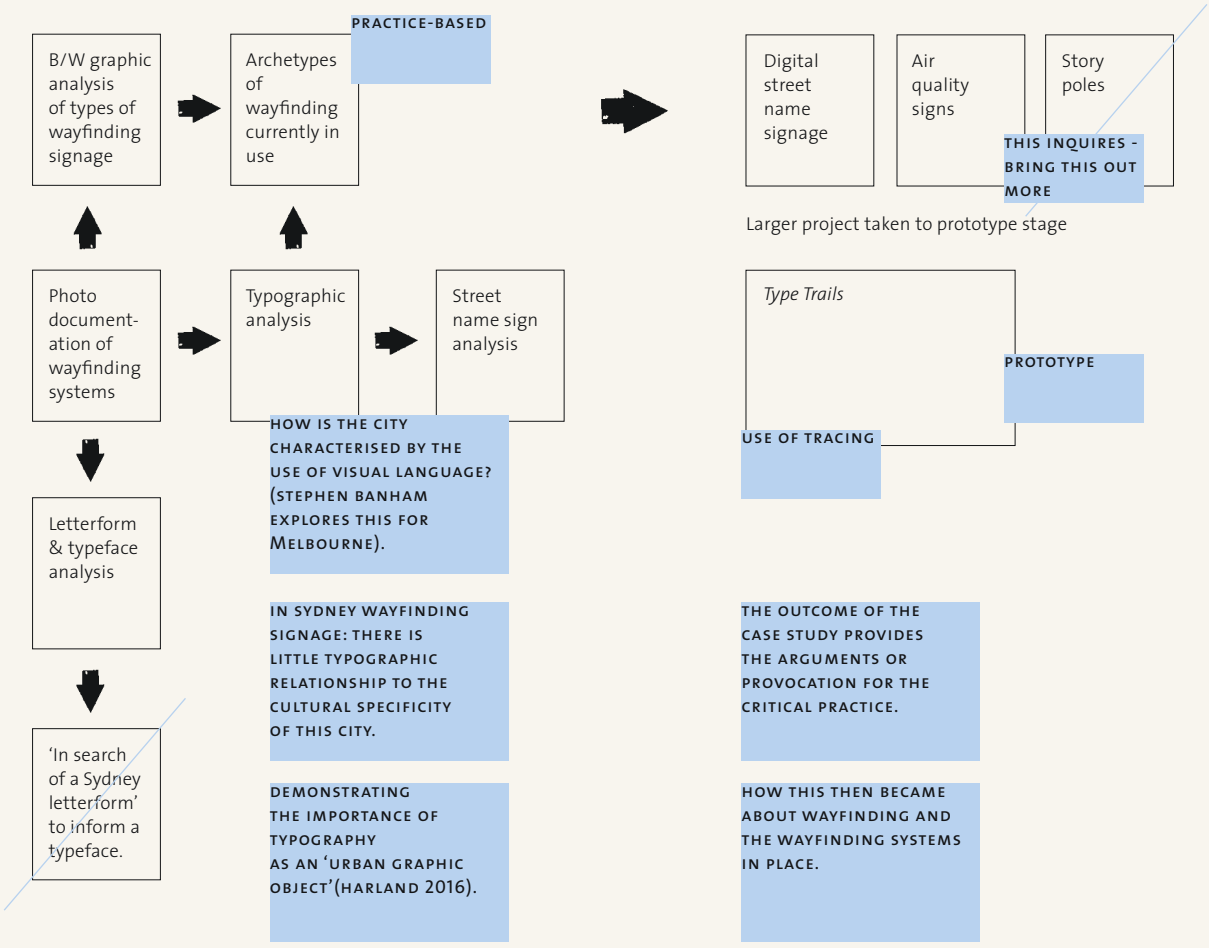
map it ▶ **walk it** ▶ **what is?** ▶ **what could be?**

Situating the research: defining the location

Photo documentation: following the methods of Phil Baines & Catherine Dixon

Photographic documentation and graphic analysis: following the methods of Herbert Spencer

Practice-based component leading to a prototype



▲

FIGURE 9

A breakdown of the practice-based components.

FIGURE 10
Pin-up as a critical feedback technique.

PIN-UP AS A CRITICAL FEEDBACK TECHNIQUE (FIGURE 10)

In order to gain feedback on the practice-based component of my research, it felt necessary to deliver it in the style of a pin-up. Pin-ups became an important method for obtaining feedback in my process through this research. They provided an opportunity for critical feedback on work that is still in progress, that displays its analytical and critical thinking through mapping and annotation, drawing, reflective notes and visual evidence of precedents and theory that are being investigated and informing the work. They also gave an opportunity to talk through the work and present the thinking verbally.

Diagrams as summaries

Overview maps (diagrams) have two main functions: first (as shown in Figures 6–10 above), they can summarise the field of research, connect the theory to the practice and help formulate an argument (Grocott, 2010, p. 3; Drucker, 2013). Second (as demonstrated in Figures 11 and 12), they can summarise the practitioners' thinking at the end of an experiment. In this research, a diagram helped me articulate and summarise my process in a way that writing could not. In the process of synthesising the information in a diagram I was simultaneously doing the synthesis and producing the communication for it. The result, a diagram, became a tool to understand spatial and hierarchical and structural relationships (Drucker, 2013) and a tool of communication. In this process of working with diagrams I drew on Lisa Grocott's "figuring", which includes diagramming (Grocott, 2010). This enabled me to map and talk through what was happening during the research.

DIAGRAMATIC TECHNIQUES IN THE LAYOUT OF MY CRITICAL DOCUMENTATION TO STRUCTURE MY THINKING IN THE PROCESS OF THE RESEARCH

Part of my practice included a dialogue in my analytical research about what I expected to discover and what I did discover (see Figure 11, page 25). I instinctively thought to lay the information out this way. I often get my students to play with different voices in the text and this technique worked well in helping me decipher my own reflective annotation (a dialogue with self) and links to other content. This technique also helped me to reflect on the main questions embedded in each experiment or analytical enquiry.

Within these diagrammatic layouts, typography was used as a structural tool because it connects theory and practice and through this the reflective dialogue is revealed. Diagrams were a way of mapping out my thinking to make connections between ideas. These structural ways of working through information and relations of meaning (Drucker, 2013, p. 87) helped me to draw out the insights relevant to each experiment.

WHAT I EXPECTED TO FIND/WHAT I DID FIND

My expectation on this walk is that I would find examples of interesting letterform that could start a Sydney archive, in the tradition of the Central Lettering Record held by Central Saint Martins, London.

The walk produced very little in the way of interesting letterform for potential archives. Most typefaces are existing global typefaces and there are very few examples of lettering. In this analysis I did look outside my defined area of research at the possibility that a Sydney typographic archive could be a result of this research.

I expected to document the haphazard nature of Sydney's traffic signs and the illegibility in typographic layout, structure and letterform.

What took my attention was just how many signs were traffic focused, competed with one another and with the pedestrian-based signage. There were instances where a very large number of signs were situated on one pole. The street signage that was pedestrian focused was generally designed to integrate with the environment but there was room for more identity, particularly in the choice of typeface and typographic hierarchy. A lot of the identity in these systems derived from global systems

My expectation of this walk is that I would find letterform as stimulus for how I could think about alternatives for typographic systems for wayfinding within the environment.

Analysing this signage has made me consider how digital wayfinding could integrate more with physical wayfinding in this area.

I also expected to find a reasonable amount of heritage and culturally-based signage.

There was a large number of heritage-based wayfinding systems currently in this area, as signage communicated in the public space. The Musuem of Sydney has some interpretive signage in its forecourt space, as did the gates to the Botanical Gardens and there were a lot of heritage-based hoardings put up by the City of Sydney. There was also a system of green circular signage about the history of architecture and buildings. There was some old fading heritage signage in Jesse Park and the new brown park signage system designed by Frost Design across the City of Sydney area that includes an element of heritage or cultural storytelling and Gadigal language. There is a Welcome to Country sign when walking towards the Opera House which also works as an audio gateway sign.

▲
FIGURE 11
What I expected to find/What I did find.

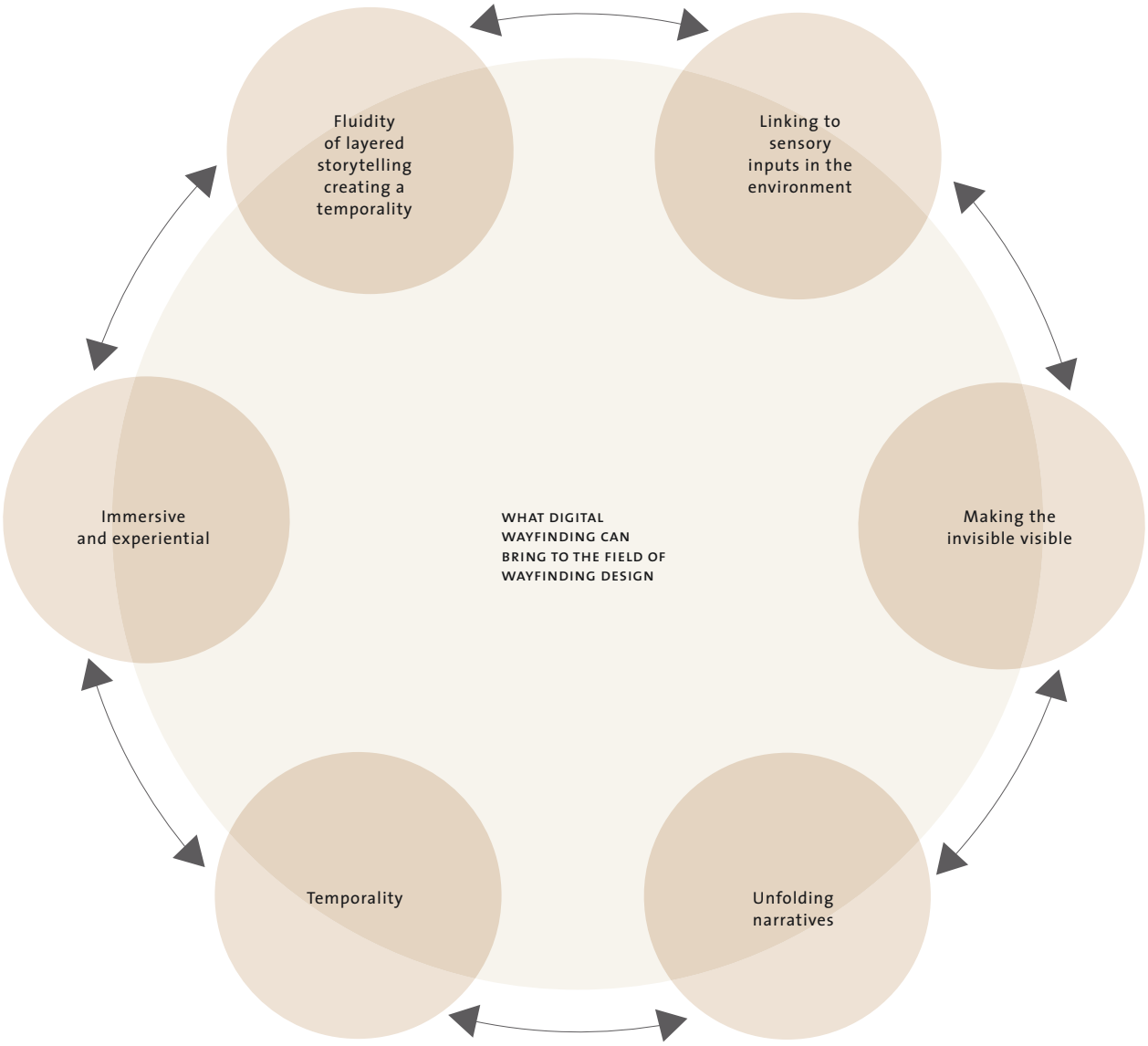


FIGURE 12
An example of these diagrams from Chapter 6: What digital wayfinding can bring to the field of wayfinding design as a result of working through the prototype *Type Trails*.

DIAGRAMS AS A SUMMARY AT THE END OF EACH EXPERIMENT

At the end of each experiment (see Figure 12), I created a diagram as a visualisation, which allowed me to decipher "the strategies of action, or the model of the phenomena" (Schön, 1995, p. 79) and to reflect on the wayfinding principles or theory embedded within each experiment/project or on the process I went through. A number of scholars have used diagrams as a form of argument or a framing device for their research. The main influence on my approach, however, in relation to these visualisations at the end of each experiment or prototype was the diagrammatic investigation by Lisa Grocott in her 2010 PhD, *Design Research & Reflective Practice: The facility of design-oriented research to translate practitioner insights into new understandings of design*. Here, I used diagrams to summarise my thinking at the end of an experiment. The diagrams were not used to present a final outcome, a final position or a final argument; rather, they were used to help synthesise the practice-based inquiry, to make connections between different wayfinding theory and the practice-based enquiry, to help articulate, dissect or visualise the main arguments of a particular enquiry and to connect the practice to the theory and to the research questions emerging out of the practice.

CHAPTER 3

Contextual Review

SECTION 1: URBAN WAYFINDING DESIGN

FIGURE 13 ▶
Sydney city street name signage and *Legible Sydney* wayfinding in Martin Place, Sydney.

What is urban wayfinding design? Where is it located? What type of functions does it have in our cities?

Walking through Martin Place in Sydney's CBD, I am reminded of **where I am** by a street name sign on a pole above me; accompanying it on the same pole is a wayfinding sign, which, in addition to the street name, directs me to the closest train and bus services, the public toilets, two local landmarks (a shopping mall and Town Hall) and the closest major streets. It is part of *Legible Sydney*, a wayfinding system in inner city Sydney that has been steadily rolled out into surrounding suburbs from December 2016 following two pilot projects in 2014 (City of Sydney, n.d.) and is based on a larger global series of Legible City wayfinding schemes, such as *Legible Moscow, Legible Madrid 2017, Walk NYC* and *Walk Rio 2015*. This global phenomenon of large "legible" wayfinding schemes aimed at pedestrians and promoting walkability in cities had its precedent in London in 2007 as *Legible London* (Fendley, 2007) and in Bristol as *Bristol Legible City* (Jeffrey, 2017; Kelly & Kelly, 2008). The strategy document for Legible Sydney, produced by Minale Tattersfield and the City of Sydney, states that the *Legible Sydney* signage is based on a relationship between a node and a journey, aiming to create a connected and accessible city through signage. Nodes are the "precinct, public transport, attractions and destinations in and area" and the journey is derived from the "information to connect villages, city centre, public transport, recreation facilities and other major attractions" (2012b, pt. 2). Legibility, in this context, is also used to represent the image, the "imaginability" of the city (Lynch, 1960).

The Image of the City was a research project into three American cities by Kevin Lynch in 1960. In this study, Lynch examined "whether the look of the city is of any importance?" (p. Preface). He questioned how the imaginability of a city (that is, the image of a city as perceived by its inhabitants) and the legibility (that is, the way in which parts of a city can be identified and ordered into a type of pattern) (p. 2) can be influenced by memory and association. He then created categories according to which he assessed the cities, Boston, Jersey City, Los Angeles and these categories still play an integral role in contemporary wayfinding design and research for city legibility. The categories are:

- landmarks: distinctive features in the environment, such as architecture, public art or natural elements
- nodes: intersections or decision points
- paths: human routes of travel, such as paths, roads and trails
- edges: the breaks that create borders and boundaries to provide a guide, and
- districts: precincts or neighbourhoods (Lynch, 1960).

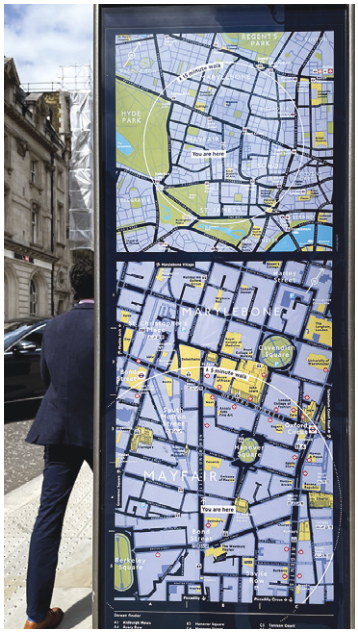
In the context of legible cities and large city wayfinding schemes, the role of wayfinding design is centred on walkability, legibility, connectivity, accessibility and finding one's way through a city; it is instructional, directional and navigational.

A redefinition of Lynch's categories for Sydney from an Indigenous perspective is provided in a framework by Dillon Kombumerri (Yugembir/Goori) for *Connection with Country* (Government Architect NSW, 2020a), as follows:

- paths: a recognition and understanding that many of Sydney's web of roads were originally Aboriginal pathways, including but not limited to George Street, Oxford Street, Pitt Street, Parramatta Road, Old South Head Road, King Street (Troy & Foster cited in Daniel, 2018; Kombumerri, 2019; Foster cited in Kombumerri & Hromek, 2021) and a focus on Aboriginal naming of the flora and fauna and geographical and ecological features of an area. The naming centres on landscape, flora and fauna rather than being named after people (Kombumerri, 2019).
- edges: a redefinition as landscape systems and water systems. The hydrological grid of the Sydney Basin and its underlying system of water, as well as harbours, rivers, streams, wetlands and "creek corridors" (Government Architect NSW, 2020b; Kombumerri, 2019).
- districts: defined through Aboriginal land management strategies, such as fire-stick farming (Kombumerri, 2019).
- nodes: Aboriginal culture expressed through public art and public space and Welcome to Country (Kombumerri, 2019).
- landmarks: cultural building landmarks, heritage landmarks and the memory of what lies beneath them (Kombumerri, 2019).

These categories provided me with a comprehensive local model to wayfinding design, bringing the focus of wayfinding design back to the local through Indigenous knowledges and understandings of wayfinding.

Photos: Sean Monro



▲
FIGURE 14
Legible London wayfinding in London.

In the same manner that the British road signage system systematised road signage in Britain, the design motivation and local government desire for the *Legible London* and *Legible Sydney* systems was to reduce street signage clutter, to enhance local identity and to pull multiple forms of competing wayfinding signage into one system. (Asada, 2015; City of Sydney & Minale Tattersfield, 2012a; Davies, 2015; Fendley, 2007). Applied Wayfinding's success in forming a local identity for London was largely due to its attention to typography, its graphic elements and its ways of mapping.(Asada, 2015; Fendley, 2007). Applied Wayfinding designed the Legible London system using the Johnston Underground typeface of the London Underground because, according to a survey, it was "instantly recognisable and engendered trust" (Reising, 2009, para. 12) and additionally used the Univers font of the City of Westminster's street signage in its maps, both static and digital (Asada, 2015, p. 38). Applied Wayfinding also conducted some funded research that found that newcomers to a city build up "mental maps" as "localities" but not "neighbourhoods", while locals did the reverse (Davies, 2015). In this context, localities refers to a destination point as opposed to a communal neighbourhood. "Mental mapping", a term used in wayfinding design, refers to the process of creating a cognitive (or spatial) map of an area that originated from Lynch's concept of the imaginability of a city.

Legible Sydney provides connectivity as well as safety and disability measures. An integral part of *Legible Sydney*, for example, is the tactile braille signs at hand level on intersection poles. It also links to a digital accessibility map providing information on wheel chair access, alternative routes to stairs, public transport, parking, taxi stands and hospitals, thus promoting walkability, accessibility and controls and it directs the flows of pedestrians in the city of Sydney. The question I brought to the research was about the opportunities for adding more interpretive urban wayfinding design approaches that look at the ecological history of the area and an understanding of how we find our way in this area due to the ecological and cultural history and a commitment to designing with Country.

What is wayfinding design?

Wayfinding research is multi-disciplinary and interdisciplinary and spans many fields including, but not limited to, Indigenous critical auto-ethnography, Indigenous knowledges, environmental psychology, ecological psychology, cognitive psychology, neuroscience, anthropology, geography, urban design, engineering, architecture, visual communication design, wayfinding design, digital media, Virtual Reality, Augmented Reality and gaming design. The use of the term "wayfinding" from a wayfinding design research perspective has been attributed to Kevin Lynch (Arthur & Passini, 1992; Berger, 2005; Jeffrey, 2017; Mollerup, 2005). However, the term "wayfaring" has been in the English language since the 16th century (Arthur & Passini, 1992). In his article, "Wayfinding: A conceptual framework" (1981), Romedi Passini, who

was the first person to establish the field of study for wayfinding design, described spatial orientation as "a person"s ability to situate himself in space" (p. 18) and argues that wayfinding should not be viewed as a "static relation to space" (p. 18) but rather that it should be understood as a "dynamic affair" (p. 18), as a series of decision making points (see Figure 16) that direct behavioural action to reach a destination (1981). Writing about 10 years later, Arthur and Passini went further in *Wayfinding: People, Signs and Architecture* (1992), in which they analysed wayfinding design as a user-based profession requiring close collaboration between the disciplines of architecture and graphic design (see Figure 3). This position was further supported by Per Mollerup, author of *Wayshowing: A guide to environmental signage; principles and practices,* when he defined wayfinding as follows:

> Wayfinding is a spatial problem solving process. The problem is finding a way from a place to one or more destinations and perhaps back to the original place. The problem solving process implies recognising a problem, and it includes activities directly involved in finding a way. These activities are search, decision and motion–to seek, to decide and to move. The mental solution to a wayfinding problem is a found way, an eligible route from a place to a destination. The physical result of a wayfinding problem should be a successfully concluded journey. The wayfinder may move on foot or by vehicle. (Mollerup, 2005, p. 27)

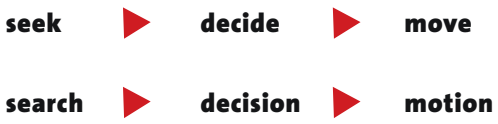


FIGURE 15 ▸
Visualising Per Mollerup's theory.

Inadvertently, Mollerup predicted where we are now with digital wayfinding with his concept of "search, decision, motion" (2005, p. 27). "Search, decision, motion" is closely aligned with how users currently wayfind using digital technologies. To "seek" often becomes the word "search" on a digital app, or when using mobile mapping. Michael Pitt, digital scholar in the built environment, proposed in a conference paper written with Yasmen Sterling in 2020 a "searching" approach to wayfinding in hospitals. The authors contend that digital wayfinding should be considered as a searching model that incorporates an individual's personal experience and needs. At odds with the way most physical signage is designed with a focus on the Lynch method of sensory cues en route, they queried whether "today's societal and technological changes" need wayfinding design to consider how systems can perform both "individually and universally" (2020, p. 9). Following on from this, systems need to be produced that react locally (that is, they incorporate local knowledge of wayfinding, specific to the area), universally (that is, so that so safety, accessibility, connectivity and legibility measures are in place) and individually (that is, so that they connect to individuals' digital networked lives).

By creating visualisations I am attempting to understand the field of study in each theorist's work and what underpins their definition of wayfinding.

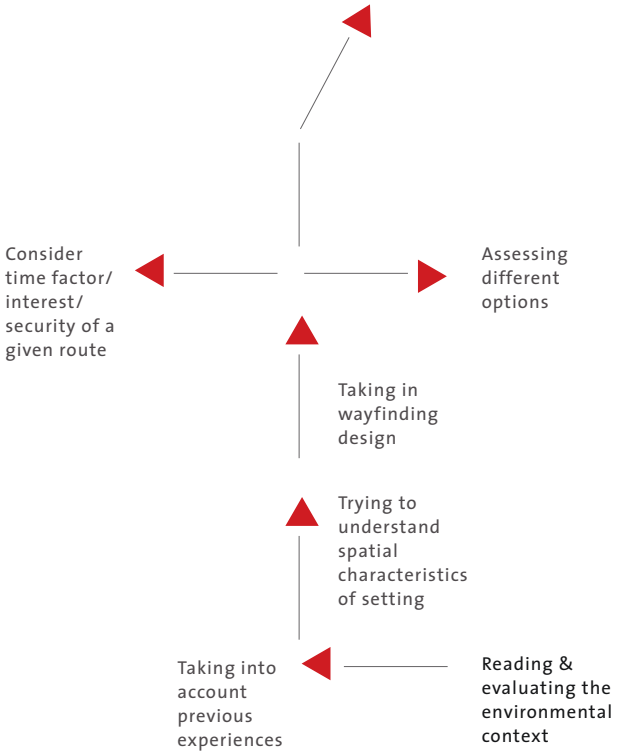


FIGURE 16
Visualising Arthur and Passini's key decision-making points for wayfinding (1992, p. 27).

Wayfinding design is defined by Passini, Arthur and Mollerup as a problem-solving process and the role of visual communication design within this as primarily information design. Passini argues that the area of wayfinding in which visual communication design can play a significant role is "the execution of plans and the transformation of decisions into behavioural actions." (1981, p. 17). This area is defined by Lynch as "wayfinding devices", by Passini as "wayfinding design" or "environmental design" and by Mollerup as "wayshowing". At the time that Passini and Arthur were writing (1992), they were defining a profession that had only recently begun to emerge as a practice in its own right and were proposing it as a valid field of research. As mentioned previously, Mollerup describes the product of their practice as "wayshowing", "the professional activity of planning and implementing orientation systems in buildings and outdoor areas" that "precedes and enables wayfinding" (2013, p. 6). Wayshowing is made up not only from wayfinding design or urban design but by architectural, urban and natural devices in the environment (Mollerup, 2005). In this research, the term "wayfinding design" is used. Jeffrey mentions that the term "wayshowing", although very apt, has not been widely used in the UK and, although this author also finds it very apt, it is not widely used in applied wayfinding practice in Australia.

It is also important to note at this point that the role of the visual communication designer in this field has expanded, due to the advent of digital wayfinding and the ability of visual communication designers both to work across signage and digital platforms and to visualise information. It has also expanded due to the ability of visual communication designers to visualise storytelling. This shift in the field of wayfinding design to a include a digital practice offers more opportunities to integrate layered information.

In his 2002 article "Wayfinding Research and Design: An interdisciplinary approach in the development of design knowledge and its application", Passini expands on how wayfinding design fits into city planning:

> ...(1) the organization of the space and the circulation system created by architects and planners defining the problem people have to solve, and (2) environmental communication designed by architects, graphic designers, information designers and others providing the information for people to solve the problem.
>
> The conceptualization of the spatial organization and the circulation system appear early in the design process. It is already at this point that the wayfinding tasks of the future users are determined. (Passini, 2002, pp. 98–99)

David Gibson, author of *The Wayfinding Handbook: Information Design for Public Places,* expands on this when he discusses how designing for wayfinding involves deciphering the "hidden logic" of a site or place, "based on patterns of movement or spatial organisation" that can become a framework for a wayfinding system (Gibson, 2009, p. 44). *Legible London* demonstrates this through its attention to the mapping of neighbourhoods. Gibson put forward these four strategies based on city planning and emphasises how historic city plans also inform wayfinding design, an "understanding of how cities evolved systems that organize or define their social and geographical structures is essential for effective wayfinding practice" (Gibson, 2009, p. 37). This gives the basis for an urban design wayfinding project to look beyond the spatial and circulation system and at other historical features that might influence a wayfinding system. Gibson outlines four models:

- "The connector model": connects routes
- "The district model": links neighbourhoods
- "The street model": links streets
- "The landmark model": landmarks take hierarchy of place (Gibson, 2009).

Collete Jeffrey added a fifth model to this based on her research in hospitals:

- "The node model": decision points are prioritised (Jeffrey, 2017, p. 514).

In addition, Gibson notes that historical visual devices or cues that have become unique to a city's wayfinding history and entrenched into its public memory of place can also form the basis for an effective local system (Gibson, 2009, p. 39). Landmarks that no longer exist can still be held in public memory and used as navigational devices. In an article in *The Guardian* (2015) by Jenny Gustafsson "Mapping, Beirut-style: how to navigate a city without using any street names", Gustafsson comments on how landmarks that no longer exist in Beirut but remain in public memory are used in verbal communication for navigation. Through examining more experiential forms of wayfinding design centred on a storytelling approach, wayfinding designers can also follow the "hidden logic" of a story, the invisible elements in the environment or the memory of landmarks.

* Mollerup explores 9 different strategies for single destination wayfinding and excludes 'random searching'.

FIGURE 17
Visualising Mollerup's theory on wayfinding and wayshowing.

Mollerup adds to this body of wayfinding design theory with different single-destination wayfinding strategies for users that exclude "random searching":

– Track following (following signs, lines or other tracks)
– Route following (following a path)
– Educated seeking (using prior knowledge)
– Inference (concluding from sequential designations)
– Screening (systematic searching)
– Aiming (visual targeting)
– Map reading (using portable and you are here maps)
– Compassing (using compass directions)
– Social navigation (social navigation and learning from others)
(Mollerup, 2013)

The challenge now for designers working in this wayfinding design space is to re-think these strategies in light of digital wayfinding, not just as pre-visit information but as new digital strategies that can be included in this list. Mollerup mentions this himself: "To some degree, modern GPS technology and smart-phone maps and apps make wayfinding strategies redundant. However, not all travellers are equipped with – or want to use – these devices" (Mollerup, 2013, p. 43). Emergent technologies have changed a lot since 2013, perhaps it is not that the strategies are made redundant but that the strategies now need to be revised and updated to include the digital methods used in wayfinding through GPS navigational aids; or the way notifications and haptic taps on location based devices might influence navigational decisions; or the state of being in a continuous connected state to social online networks; or the social networked and game-like habits of users on wayfinding and daily task applications (Wilmott et al., 2018).

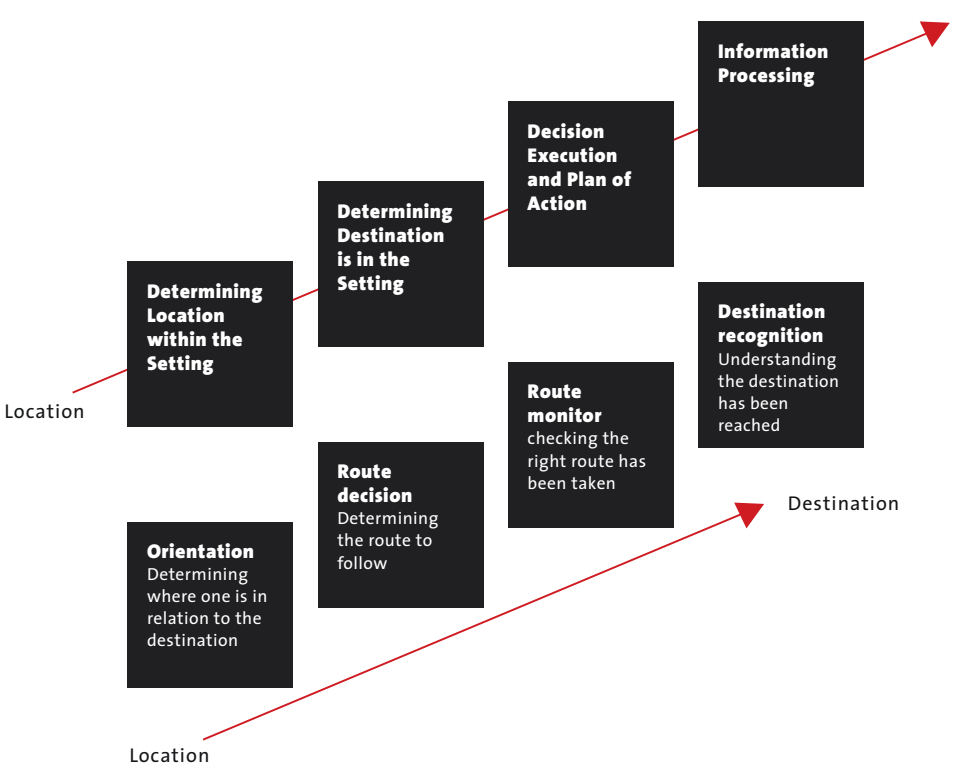
There is also a need for these wayfinding strategies in Australia to be informed by Indigenous ontologies, epistemologies and wayfinding knowledge through Indigenous-led research and projects.

A distinction between wayfinding and navigation

Before I examine the way storytelling contributes to the types of urban wayfinding experiences that cities offer, it is important at this point to distinguish between the definitions of navigation and wayfinding. Many scholars and authors use the terms interchangeably. Lynch defines wayfinding as "the consistent use and organisation of definite sensory cues from the external environment" (Lynch, 1960, p. 3). Anthropologist Ingold defines the role of navigation when using a "cognitive map" as a spatial task that is separate to the role of "orienting" or "wayfinding". He explains this difference with a triangular diagram; on one side he gives the example of a cartographic map that is a spatial representation of place. On the second side he shows the act of mapping as a process of wayfinding and on the third side he depicts the act of using the map as navigation (2000, p. 231). He describes the role of navigation as a "cognitive task" in which one follows a set of instructions to reach a set location that has geographical co-ordinates (Ingold, 2000, p. 236). He positions the role of wayfinding as more akin to storytelling, because "places do not have locations but histories" (2000, p. 219) and comes to this position through his research into many Indigenous forms of wayfinding and through the influence of an ecological approach to the perception of the environment by James Gibson (1979). Ingold describes wayfinding as a performative act over time and place in which wayfinders gain their knowledge of place or pathways "as they go" and that "people's knowledge of the environment undergoes continuous formation in the very course of their moving about in it" (Ingold, 2000, p. 230).

Scholars Iosefo, Harris and Holman Jones, remind us that alongside the traditional skills of wayfinding that are "understood as the sea or land navigation skills of Indigenous peoples" (2020, pp. 15–16) Ingold omits to acknowledge the most important aspect that Pasifika wayfinding is "cumulative knowledge of Pasifika culture" passed down and shared generation to generation (2020, p. 17). "At the heart of wayfinding in the Pacific is the ancestral genealogical connection to the environment and its people" (Iosefo et al., 2020, p. 19).

According to Downs and Stea, who come respectively from scholarly architectural and urban design fields, a cognitive map "is not necessarily a 'map'" (1973, p. 11) but a "cognitive representation which has the functions of the familiar map but not necessarily the physical properties of such a pictorial graphic model." (1973, p. 11) They define cognitive mapping as the cognitive process of reading the environment in order to navigate and wayfind through it, and as a "process of acquiring, amalgamating and storing spatial information". They break this process down further by describing it as "a series of psychological transformations by which an individual acquires, codes, stores, recalls, and decodes information about the relative locations and attributes of phenomena in his everyday spatial environment." (Downs & Stea, 1973, p. 9)



WAYFINDING PROCESS DEFINED BY ARTHUR AND PASSINI

FOUR-STEP PROCESS OF NAVIGATION OUTLINED BY MELZE AND MADISON

FIGURE 18
Comparing wayfinding strategies by Arthur and Passini with the four-step navigation framework outlined by Melzer and Madison.

The cognitive abilities to navigate through space have been defined as "landmark knowledge" "route knowledge", "graph knowledge" which ultimately advances to "survey knowledge" (Melzer et al., 2020, p. 3). The process of acquiring "survey knowledge" is described as a four-step process which begins with the ability to orientate oneself and, as Arthur and Passini also describe, determines the destination in relation to the current setting. The process is to move through an environment and understand directions based on landmarks, from which the route knowledge is gained. This advances to survey knowledge, at which point the bigger picture of the environment is understood and it is the representation of this that is the cognitive map, or bird's eye view representation (Melzer et al., 2020). A recent addition to this is graph knowledge, "a step between Route and Survey in which people connect the various landmarks together much like a network map" (Melzer et al., 2020, p. 3). Contrasting this navigation process and the process that Arthur and Passini define as wayfinding shows that these frameworks are very similar. Therefore, wayfinding design that follows these frameworks is largely based on a navigational rather than a wayfinding process, according to the broader definition of wayfinding that Ingold, Heft and Indigenous wayfinding knowledges present.

Theoretical and cultural approaches to wayfinding

> *Whilst listening to a curator from Sydney Living Museums brief my students on a wayfinding project for a Sydney Colonial Farm estate, I was interested to hear him mention to the students how the house plans (which are often frequently used by designers in communicating wayfinding in historic houses) often didn't communicate as a wayfinding tool for visitors from cultural backgrounds that hadn't grown up with learning to read maps, (cartesian learning), that these visitors did not interpret a birds eye view house plan as a way to navigate through the house. (Journal documentation, 25 August 2020)*

In an article in *Nautilus* (Feb, 2020), "There's No Homunculus In Our Brain Who Guides Us: Why the cognitive-map theory is misguided", reporter M.R. O'Connor, author of the wayfinding book from which this stems, *The Science and Mystery of How Humans Navigate the World*, recommends that we adopt Ingold's definition, saying that "reaching beyond the cognitive map metaphor opens up new possibilities and ways of thinking about our direct experience." (O'Connor, 2020, para. 14)

Although Ingold and Heft formed insights on wayfinding from different disciplinary perspectives, they were heavily influenced by the ecological psychologist James Gibson and his approach to the ecological perception of the environment. Gibson's book *The ecological approach to visual perception* (1979) is heavily cited in wayfinding and cognitive mapping theory. Gibson's ecological approach to wayfinding provides a counter argument to the cognitive map, which is summarised here by Portugali, a geography scholar, who edited the book *The Construction of Cognitive Maps* (1996):

> ... perception (and thus cognition) is direct, immediate and needs no internal information processing, and is thus essentially an external process of interaction between an organism and its external environment. (Portugali, 1996, p. 3)

Heft argues that the reliance on a cognitive map is not an intrinsic, individual, biological ability but is largely a western (and colonial) construct, learnt in childhood and from socio-cultural histories, and that wayfinding can therefore also be thought of as a journey along a familiar route that is performative and involves learning as you move, a process of "perception–action" (Heft, 2013, p. 24). Earlier in his career, Heft led a series of studies on vistas and transitions that led him to his argument that wayfinding is temporally structured and that the wayfinding journey involves "the detection of information over time that is specific to the surface layout of a particular path of travel" (Heft, 2013, p. 24).

Heft examined ethnographic evidence of social-cultural navigation in Indigenous societies in Canada, Australia, Malaysia and Micronesia and then reflected back on spatial navigation in western societies. From his research into Indigenous practices of wayfinding he concluded: "the layout of the immediate area, and even more distant places, is part of the fabric of social discourse in the community" (Heft, 2013, p. 20). This led him to determine that representational maps, such as the bird's-eye view metaphor of the cognitive map, are a western construct of navigation and wayfinding.

An ecological approach to wayfinding is imbued with the idea that wayfinding is temporally structured and that wayfinding is learnt through the socio-cultural and environmental conditions of place (Heft, 2013).

In her 2019 doctoral thesis *The (Re)Indigenisation of space: Weaving narratives of resistance to embed Nura (Country) in design*, Danièle Hromek[9] explains how from an Aboriginal perspective, storytelling, mapping and walking Country are deeply entwined:

> Mapping Country through walking creates a map of the lived experience of places, in a way, a true knowledge of place. Mapping lived experience enables a knowing of places through the senses, which interact with our emotions; it is an embodied learning of the relational narratives of that place through space and time. Navigating using Country as a means for movement embeds encountered stories into made objects. The route "drawn" into the landscape links, and at times follows, the narratives of places; this is meaningful movement that not only retells stories but writes them anew. (Hromek, 2019, pp. 196–7)

9 Danièle Hromek is a Budawang woman of the Yuin nation. She is a spatial designer, speculative designer, public artist, and researcher and director of Djinjama Cultural Design and Research.

This author does not contest that research enquiries into cognitive mapping are vital to an investigation into human navigational and wayfinding abilities (particularly from a cognitive perspective) but acknowledges that this is a westernised form of cartographic knowledge when focused on the cognitive map metaphor. The practice-based component of this research, therefore, is inspired by an ecological theoretical framework for wayfinding design that centres on a storytelling approach, and is influenced by the documents on designing for Country. This research argues that we are often designing systems for cities that are embedded in a cartographic practice at the expense of other wayfinding abilities, practices and methods, that we might exclude other cultures through this approach and that we could have a better understanding of and experience in our cities if we broadened this knowledge.

Storytelling in wayfinding design– user experience research

Storytelling is a fundamental part of wayfinding design. Asada (2015) in her Master's dissertation, *Storytelling in Urban Wayfinding* investigates the role that storytelling plays in urban wayfinding to create a varied and place-based identity, arguing that an experiential element is necessary for wayfinding and that storytelling could play this role (Asada, 2015). Asada states that while naming, typographic treatment, colour palette and the icon design of city wayfinding schemes, and a city's landmarks, all contribute to the cultural, historical and natural narratives of a city, an experiential element is required to project its distinctiveness and unique narratives. She also contends that a local pedestrian wayfinding system based on global systems aids navigation but does not provide all the answers to a sense of place (Asada, 2015). She therefore makes a decisive argument for enhancing local identity and the examples in her dissertation highlight the integral role that storytelling plays as a research tool into user experience. Among her case studies is an interview with Ben Acornley, partner and creative director at Applied Wayfinding, UK (the company that designed

Legible London). The interview describes how Applied Wayfinding gathered user stories from sketch maps, observations and user interviews of daily journeys and used this to inform their mapping, both digital and static. Her second interview, with Sami Niemelä from Nordkapp, who designed Urbanflow Helsinki in collaboration with Urbanscale, also investigates storytelling from a user experience perspective. Urbanflow Helsinki was a pioneering prototype built for smart cities from a user experience and human-centred design perspective (Mattern, 2014, para. 27). It was designed to help city visitors in their wayfinding and connect them to ambient data such as air pollution, energy consumption and city services. Its interface was a 2D bird's eye view map and was proposed to work as a touch screen positioned as several monolyths, or digital signage, in the city of Helsinki.

Mattern discusses Urbanflow Helsinki in her article "Interfacing Urban Intelligence" (2014) and questions the politics on how data presented in this manner could end up filtering out other aspects of a city. Both these projects combine elements of the local typographic treatment in each city into the design of their mapping and Urban Helsinki can be adapted to other cities. My research differs from both these projects in that it looks at ways in which storytelling could be interpreted in an experimental or poetic manner.

Storytelling is already an effective user-experience research tool in developing wayfinding systems in applied practice. Storytelling is recorded largely through user journey mapping, through user sketch maps based on mental mapping (where participants are asked to sketch how they find their way around a certain area) or through verbal retelling of journeys taken. The storytelling from this analysis is then used to help define how neighbourhoods and districts are understood and what the hierarchy of place is, what key landmarks and paths are commonly used to understand how people move around a city.

At the end of his book *Wayshowing>Wayfinding: Basic & Interactive* (2013), Mollerup describes case studies and includes many examples of wayshowing that combine large elements of environmental graphics or typographic installations as part of wayfinding design to aid the user's wayfinding experience. In these examples, physical signage is expanded into ground graphics, embedded markers, wall graphics, ceiling graphics and large text as a free-standing sculptural form. Scale is often used to significant effect; visual communication designers used graphic and, to a greater extent, typographic devices as effective visual poetic devices and explored how verbal and visual relationships can work on a large scale to aid wayfinding in the built environment, both in buildings and outdoors.

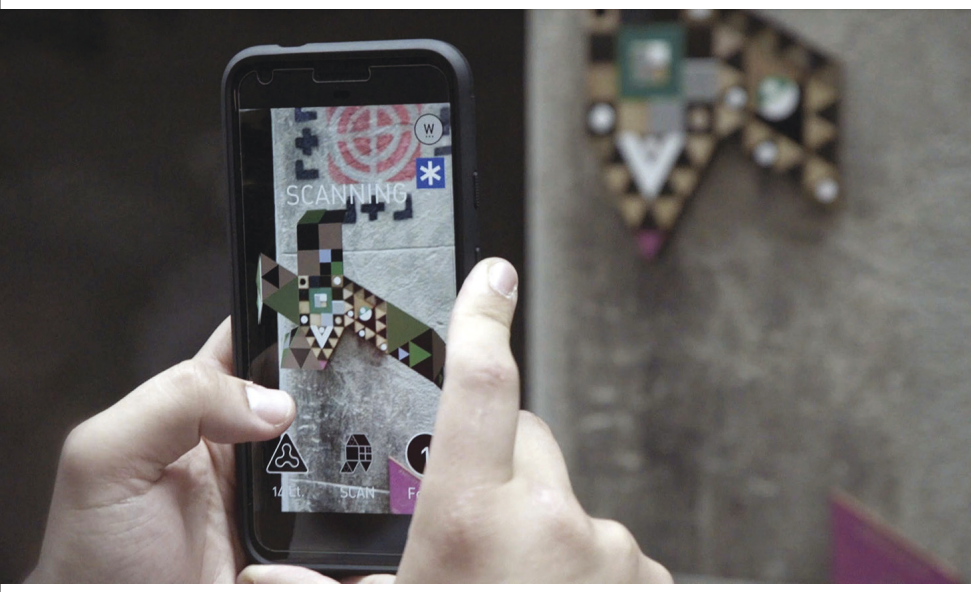
What Mollerup picks up on here is an interesting aspect because it demonstrates the impact of visual communication design in this field, that the tools of typography and graphic design used in the built environment are also being used to combine an experiential element with a wayfinding experience. Mollerup discusses how these tools add an experience and an identity, but additionally a narrative to the wayfinding experience of place. The environmental graphic design elements are entwined with the intended navigation and wayfinding of a building or environment rather than being separate entities.

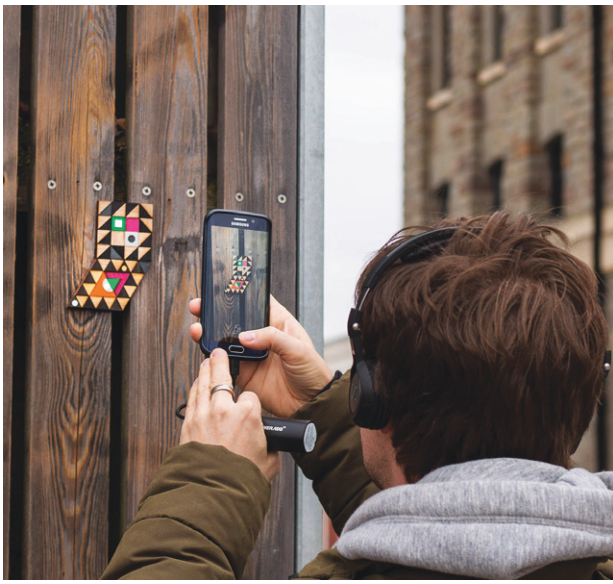
The social aspect of wayfinding

Another important contribution to wayfinding research is the social aspect of wayfinding, how the "co-presence" or "influence" of other humans contributes to wayfinding behaviour (Dalton et al., 2019, p. 2). Dalton, Hölscher and Montello have researched extensively in this field from an environmental psychology perspective of wayfinding through their respective scholarly fields of architecture, social and political science and geography. "Social aspects, i.e., the co-presence of, or interaction with, other people, can influence the heuristics, strategies, and expectations of the wayfinder" (2019, p. 2). The authors' research presents a correlation between the popularity of places that attract and the spatial fact that these places where people often end up are also places that have a good hierarchy of place and are spatially well connected to other places (2019, p. 2). They propose the following types of social wayfinders, the "co-decider" (the combined effort of a group or two people in deciding a path of travel), the route instructor (route advice given by another person during the journey or in the planning stages of taking on a route), or people as environmental cues (for example, the number of people waiting for a public bus each day may indicate to you that your bus is coming). Lastly, they discuss the trails and traces of social activity in the environment that can influence wayfinding behaviour such as footprints that indicate a short-cut has been taken or vernacular typography (Dalton et al., 2019).

In their 2019 article "Wayfinding as a social activity", Dalton, Hölscher and Montello propose that their research is integral to ways in which applied wayfinding design can create wayfinding systems and that mobile maps can incorporate this new knowledge on social wayfinding. Added to this is an area of research that needs to be included, the interaction with other people through their digital location-aware devices and applications and networked social habits. This is research into how social decisions are connected to the ways in which we are now networked using digital technologies, through geo-social activities in spatial media where spatial content is geo-tagged or referenced or geo-coded and can be created, shared or distributed (Leszczynski, 2015), or through strategies like sharing running routes and personal data on running apps, following each other's walks/tracks and how social media influences the popularity of places. This opens up all sorts of security and privacy questions around documenting and making public regular social practices.

The next section examines four existing interpretive wayfinding design approaches in cities: a seek or find approach through location-based apps; a focus on embedding Indigenous language and storytelling into the environment through signage; historical and cultural city walking apps and a typographic approach as markers and guides for wayfinding and placemaking.





Photos: Troy Innocent

FIGURE 19
Wayfinder Live, location-based augmented reality game by Troy Innocent (2016).

Examining the way storytelling contributes to the types of wayfinding experiences cities offer

SEEK OR FIND?

In his book *Wayshowing: A guide to environmental signage; principles and practices,* Mollerup argues that there are two types of travellers, those who like to find their way around a city and those who like to be directed. Similar to this, during the Legible London project, two distinct personae were created "from the knowledge gained in the Bristol project" for *Legible London* that were coined as the "strider" and the "stroller" (Asada, 2015, p. 8; Davies, 2015, p. 26; Jeffrey, 2017, p. 518). "A stroller seeks memorable experiences by drifting and wandering through a new city focusing on the environment, a stroller needs information that allows them to drift, wander, and have the confidence to get lost" (Jeffrey, 2017, pp. 517–18) "A strider wants to get to their destination as quickly and efficiently as possible and their strategy is often to get near, then use information and the environmental cues to find their destination." (Jeffrey, 2017, pp. 517–18). The current *Legible Sydney* wayfinding infrastructure caters well for the "strider" who wants to be reminded where they are, but what about the "stroller" who wants to find their own way and get lost in that narrative?

"Wayfinding Live" is a location-based AR game originally situated in Melbourne's laneways in 2016 and then in Taipei and Bristol, Dublin and Barcelona designed by games designer, artist, academic and researcher Troy Innocent. The game uses pattern recognition to create a wayfinding challenge. In the tradition of treasure-hunt apps and games like Pokémon GO, this AR experience places navigator visual cues (place-holders) in the environment that open up and reveal parts of the narrative when scanned by a phone. In contrast to Pokémon GO, "Wayfinder Live" is designed to look embedded within the built environment of each city it is played within and situates itself in the more hidden environments of the city like the laneways (Innocent & Leorke, 2016). This AR wayfinding experience not only caters to those who find but also creates a successful virtual gaming journey that interacts with the physical real-time experience. Adding an element of finding into wayfinding opens up opportunities for a more imaginative, interpretive response to the wayfinding journey.

Photos: Susan Mavor

▲
FIGURE 20
Wayfinding for District of Tofino, BC, Canada. Design by Susan Mavor, PUBLIC Communication (publicdesign.ca).

EMBEDDING INDIGENOUS LANGUAGE INTO THE ENVIRONMENT

The Vancouver architecture and wayfinding design company Public Design has designed a comprehensive wayfinding system, a district-based wayfinding signage scheme, completed in 2017, for the District of Tofino, on the far west coast of Vancouver Island. The wayfinding signage embedded the local Nuučaaʔuɬʔatḥ place names into the signage, including information panels about the importance of the Indigenous relationship to the area. By incorporating storytelling techniques into a connected city-wide wayfinding signage[10] system, it highlights the significance of the Indigenous narrative and embeds language and storytelling into the orientation of the environment.

10 https://publicdesign.ca/work/tofino_wayfinding

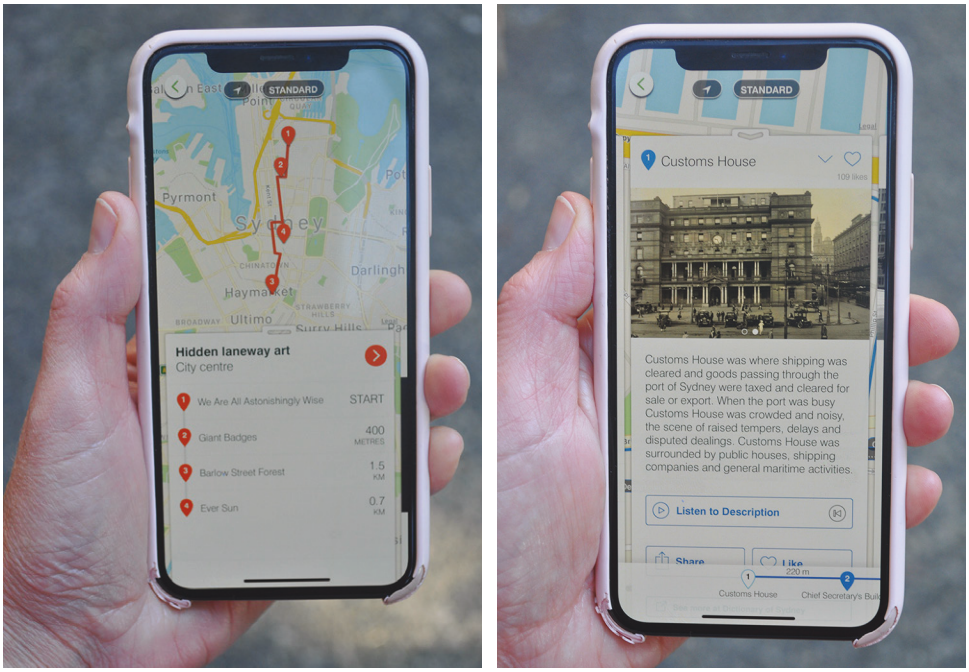


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FIGURE 21
City of Sydney Culture Walks.

THE CITY AND WALKABILITY: WHY WALK AND EXPERIENCE STORYTELLING?

Local and state governments have an interest in communicating and integrating ecological, historical and cultural narratives through wayfinding experiences into the environment and are keen to embed storytelling into their centres, walkways and parklands, are looking for ways to do this. City walking apps also work from a find-and-discover motive but the "find" is often scripted around a narrative rather than having the user generate the story. Often the storytelling is split into themed layers, like the wayfinding for the covered market in Como, Italy. Here, the city has been curated into distinct walking and story-telling experiences, such as "The Medical City" and "The Rationalist City", that give a historical, heritage and cultural guide through the architecture and streets of the city through different periods in time. Layering storytelling in historical themes is also a technique used through geo-located walking apps for the City of Sydney Culture Walks, the Dictionary of Sydney Walks and the Botanical Gardens Visitor Guide app where the user can select a cultural or historic topic to walk to and be given information related to place and/or theme along the way.

Guided (geo-located) apps provide a great way for the traveller to pick up a journey at their own pace and to select from a menu of different story-telling threads or themes, selecting a text-based or audio experience. Often mapped from a beginning location to a destination point, these apps allow a traveller to pick up a journey or end it at any point they wish to. This further allows the traveller to re-imagine a landscape based on the content provided and within the setting in which they are situated. This process, however, can often be very prescribed. Local governments and government bodies need to be careful that they are not only displaying the "grand narratives" (Farman, 2015, p. 106) but also finding a way to add more voices or community-based interaction to it. As a more community based approach, the online mapping system "History Pin"[11] collects and shares memories of place through local users and can be used for community projects and educational purposes. "History Pin" is a website resource rather than a mobile storytelling experience but offers a way that community-based memories and history can be sourced.

11 https://www.historypin.org/en/

TYPOGRAPHY TECHNIQUES AS MARKERS AND GUIDES FOR WAYFINDING AND PLACEMAKING AS VERBAL/VISUAL RELATIONSHIPS

A typographic interpretation by P-06 Atelier and Global Landscape Architecture exploring verbal/visual relationships of the onomatopoeic sounds of an overhead bridge and large paragraphs of type from the words of a local poet guide cyclists along the River Tagus cycle path (Bikeway Belém project) in Lisbon, Portugal (Mollerup, 2013, p. 224; SEGD, n.d.). Typographic installations that work with wayfinding in this manner explore new ways of reading a city. Typography's role in wayfinding is often viewed purely from a legibility focus. Real world examples where the typographic installations have worked hand-in-hand with city walking schemes add another visual answer to the question "Why walk and experience story-telling?" The Wellington Writers Walk, in Wellington, New Zealand by Catherine Griffiths (a visual communication designer) works in a similar way but as a pedestrian path as opposed to a cycle path. So do a number of works by Why Not Associates and artist Gordon Young in the UK, who explore spatial narratives with literary narratives in the landscape in a number of their environmental typographic installation projects. These examples work with layering storytelling, adding an element of local identity. The storytelling is designed as a non-linear narrative, allowing the user to pick up the walk/cycle path at any point and in any direction they wish, often operating as a visual, navigational guide.

In the case of Lisbon, the literary device of onomatopoeia is played with visually, such that letterforms repeat, make patterns and reflect the sounds of traffic on a bridge. Visual communication designers play an important role here as they understand reading strategies in this kind of context, including the contrast of scale, macro and micro details and how non-linear narratives can be set spatially. The scale and how you read from a cyclist's point of view is taken into consideration. In Catherine Griffith's work, paragraphs of quotations from honoured New Zealand poets and authors are embedded or extruded from concrete plaques moulded into the Wellington waterfront landscape. Due to the scale and careful consideration of materiality, legibility and identity by Griffiths, these quotations become a combination of a literary narrative and a walking experience.

Both of these examples are spatial narratives that combine journey with a non-linear literary narrative and explore visual/verbal relationships. The visible language is embedded in the landscape to become part of the urban environment fabric. Walking through it, over it or beside it creates an experience very different to that of reading the books. Analysing this work influenced the exploratory element of the practice-based component of this research, which then became a question of how we can expand this form of experience and these relationships into a digital wayfinding experience.

Conclusion

FIGURE 22
Wellington Writers Walk, Wellington, New Zealand. Design by Catherine Griffiths, (catherinegriffiths.co.nz).

A distinction also needs to be made at this point between the way users perform wayfinding, wayfinding design and for whom the wayfinding design is operating – for the individual user, or for the city as a whole. Urban wayfinding signage schemes tend to operate for the city as a whole, but under the control of local governments or councils, while digital wayfinding tools and mobile maps tend to be user-based, personalised and connected to the user's personal data. This opens up all sorts of security questions about personal data collection and protection and the politics of who owns and controls big data. Large-scale urban wayfinding systems operate to provide a "'legible city' where wayfinding and identification elements support the overall urban structure and experience" (Berger, 2013, p. 6).

The Sign Research Foundation funded and published a comprehensive document *Urban Wayfinding Planning and Implementation Model* in 2013 led by Craig Berger. The research was based on case studies and provides a model for economically successful large-scale city-based wayfinding schemes. Berger argues that, even with the ease of digital mapping and wayfinding tools, there is still a need for physical wayfinding signage elements "such as monuments, directional signage, directories interpretive and regulatory even regulatory signage" (2013, p. 5) that, in addition to playing an integral role in "basic navigation, identification and information", play an integral role in defining where a user is and enriching a user's experience in a city (2013, p. 5). The importance of local identity and the functional, regulatory, economic and directional requirements are all explored; the one aspect of urban wayfinding design that is not explored is the role of storytelling. This author agrees with Berger's argument that these wayfinding elements in our environments "enrich and enhance" (2013, p. 5) our experiences and that legible wayfinding schemes play an integral and successful role in our cities, fulfilling the purposes for which they were built. This research puts forward the argument that we also need public systems that focus on how we find our way that are less directive, that provide community input or a diverse set of voices and a richer orientation to place through local ecological and cultural storytelling.

SECTION 2: DIGITAL WAYFINDING

Emergent technologies are transforming traditional approaches to wayfinding design in the urban public-built environment. Networked environments, connectivity, environmental sensors, artificial intelligence and new technologies are re-shaping our cities and the physical systems within them. Personalised wayfinding through digital wayfinding tools has created new wayfinding methods: with location-aware devices we can find instant place-based, location-based and wayfinding tools at our fingertips (Gordon & Silva, 2011, p. 2; Hughes & Mee, 2019). *Legible Sydney* is just a part of the way an individual is likely to perform wayfinding in the city of Sydney.

GPS [12] and GIS [13] have arguably transformed the way we all now navigate (Milner, 2016). Following the advent of GPS navigation [14] in vehicles, largely championed by the company Garner (Milner, 2016), Google Maps appeared as a web application in 2005, followed by the launch of the iPhone in 2007 (Lammes et al., 2018, p. 3) and Google Maps released its app for Android and IOS location-aware devices in 2008. This has transformed into the many and varied ways we wayfind through our location-aware devices (smart phones, wearables, personal computers etc) and location-based systems (LBS). These range from wayfinding information experienced in situ through wayfinding applications and mobile maps to geo-social applications that network and highlight location and geo-tagged information such as photos or posts (Leszczynski, 2015; Park & Evans, 2018). "GPS guidance has become so ingrained in people's habits" that it is often trusted by the individual user above other principles of wayfinding (Milner, 2016, p. 10). It has become the "go to" technology. Coincidentally, around the same time as these developments were taking place in digital wayfinding, physical signage in cities began to expand into legible signage systems based on walkability, legibility and connectivity. In the case of *Legible London*, this progressed into an accompanying customised digital mapping system (Transport for London, n.d.). The obsession with locating where one is at all times, often attributed to the use of GPS in combination with GIS systems and location-aware devices (Leszczynski, 2015; Milner, 2016), is also amplified through the *Legible City* schemes for wayfinding purposes that instantly connect the user/traveller to the nearest amenities, transport, landmarks, nodes and paths, as well as the local economy. But does this actually orientate pedestrians to their environment, to place and to ecological information, or to historical or cultural information?

The way users navigate in the urban environment has been notably altered by digital wayfinding (Garcia-sterling & Pitt, 2020; Park & Evans, 2018) and is "changing how we interact with our surroundings" (Park & Evans, 2018, p. 276). Digital wayfinding in the urban environment encompasses a whole range of possibilities, from digital mapping systems (GIS) in combination with GPS navigation and location-aware devices to applications or websites that are triggered through QR codes, beacons in the environment that trigger notifications on location-aware devices, digital mobile storytelling experiences and digital signage that is connected to personalised systems or other online social network connectivity.

12 GPS as described by Milner: 'GPS is in essence, a massive clock, with all 24 active satellites broadcasting a contant pulse synchronized to the nanosecond and ultimately tied to the master clock maintained by the US Naval Observatory. Our GPS receivers gauge positioning by measuring the amount of time it takes at least four of these satellites' pulses to reach it.' (2016, p. 11).

13 Geographic information systems (GIS) took hold in urban geographic and urban planning in the mid-1980s (Ash et al., 2018)

14 Initially created as a navigational device for the US military in 1995 (Jeffrey, 2017; Milner, 2016)

15 Most GPS systems use a combination of algorithms, artificial intelligence and satellite navigation. (Melzer et al., 2020)

There is a considerable amount of research and literature on the decline in the human ability to navigate spatially due to the advent of GPS [15] and wayfinding technologies that use GPS (Melzer et al., 2020; Milner, 2016; Ricker et al., 2015), including how this neurologically affects our cognitive development, particularly in the area of the hippocampus (Melzer et al., 2020). Melzer and Madison, who research effective AR frameworks for wayfinding and navigation in "high-stress environments" (2020, p. 1) such as the US military, state in their 2020 paper "Birds do it. Bees do it. A bio-inspired look at wayfinding and navigation tools for augmented reality" that the US military often still trains its personal without GPS enabled-navigation or wayfinding tools in order to expand their ability to navigate spatially (Melzer et al., 2020). From a media communication studies perspective that does not focus on navigational cognitive abilities, being networked through location-aware devices and moving around in an urban space creates a new relationship to perceptions of space (de Souza e Silva, 2013, p. 118). Adriana de Souza e Silva and Eric Gordon, who research mobile communication from a media communication research perspective, call this "net locality" (de Souza e & Silva Gordon, 2011):

> Net locality is practiced hybrid space, developed by the constant enfolding of digital information and networked connections into local spaces. Net locality is based on the recognition that we are networked, but still connected to local spaces, and that belonging to a global network strengthens local connections. This concept directly challenges traditional views of mobile communication, which emphasize users' disconnections from local spaces. In net locality, remote connections are still present, but become part of the space in which the mobile user is, instead of removing users from it. (de Souza e Silva, 2013, p. 118)

Emphasising the other influences in this networked space are environmental psychologist and architect Giyoung Park and environmental and developmental psychologist Gary Evans. They question the politics involved in the way the crowd sourcing behind location-based services (social, wayfinding and mapping applications) works and whether these services reduce the ability to drift and get lost in cities, the ability to "simply wander and explore places unknown" (Park & Evans, 2018). They argue that geo-tagged data in location-based services could be homogenising local identity and landmarks because they prioritise or limit search results through global trends that highlight amenities that are neither very distinct nor different in any culture. They give the example of coffee culture, rather than unique landmarks in the environment and biases that are inherent in the services running geotagged information that prioritise high volume (Richter, 2017 cited in Park & Evans, 2018, p.277), in which minority groups are likely to be under-represented. Extending out to look at other forms of digital media, de Souza e Silva and Frith discuss how interactive mobile experiences can also reconnect users in new ways. In their article "Re-narrating the city through the presentation of location", they suggest that individuals can shape how locations are presented in ways that were not possible before (de Souza e Silva & Frith, 2013), which opens up opportunities for mobile storytelling and other digital media to the many and varied voices that could contribute to the narratives of place.

How we perform wayfinding due to our new digital habits

Personalised wayfinding tools and digital wayfinding signage differ from static wayfinding mechanisms in cities in that they contain "dynamically changing information" (Manovich, 2006, p. 220), real-time data, and maps that shift and move. (R. Gibson, 2014; Wilmott, 2020). "Digital technology has facilitated the advent of the city as an 'augmented space' where physical space 'is overlaid with the dynamically changing information'" (Manovich, as cited in Triggs, 2008, p. 260). Most people currently wayfind using their smartphones and the variety of mobile maps and apps they have to offer (Ricker et al., 2014; Hughes et al., 2019). Wayfinding as an everyday activity becomes caught up in the many and varied everyday social activities and encounters that a person is involved with at the same time through their networked environments. (Ash et al., 2018, p. 42). "Importantly, they do so in situ, on-the-move and in real-time, augmenting a whole series of activities such as shopping, wayfinding, sightseeing, and protesting." (Ash et al., 2018, p. 42).

In 2014, Ricker, Schuurman, and Kessler, geography and geographic information science scholars, ran a user-based study to determine whether users were concerned about what using smartphones for wayfinding was doing to their spatial navigation abilities. The research revealed that most people would wayfind using a smartphone and that it made them feel more confident in wayfinding for their everyday needs and when travelling in new locations. It also determined that users were not concerned about losing their spatial navigation abilities through the combination of GIS and GPS navigation systems. They also noted that this was leading to a new way of wayfinding through "changing our expectations of experience of place" (Ricker et al., 2015, p. 646). Hughes and Mee, who authored the article "Wayfinding with my iPhone: An autoethnographic account of technological companionship and its affects", also see the uptake of digital wayfinding creating a new way of wayfinding but they put forward a separate concept for it, arguing that a type of "travel companion" relationship is formed with location-aware devices, which leads to an "emotional", personal and "sensory engagement" with them. (Hughes & Mee, 2019, p. 7) Does this mean that digital affordances from the devices we use and the applications we are running also influence our wayfinding behaviour, for example, the haptic qualities of notifications on Apple watches? In addition, how do these learnings from the way we work with digital wayfinding become considerations for how we design for both digital wayfinding and physical signage?

The relationship of daily activities to play is further enhanced by wearables when the haptic relationship and small animations in notifications enhance this (Wilmott et al., 2018). The Apple Watch invites the sharing of personal data related to the body and activities are "segmented into minute tasks" (Ash, as cited in Wilmott et al., 2018, p. 88). This creates new habits (Wilmott et al., 2018, p. 81) and in the case of the Apple Watch, notifications become a cue for instigating movement through haptic "taps" and quick animations that catch the eye. Apple Watch apps are largely designed around actions that are designed to relate to personal data or to the environment. Apple Watch guidelines specify that the role of apps for the device are quick actions (tasks) (Apple Developer, 2021). Examples of existing apps come up under categories of breath, exercise, heart, timekeeping, diarising, organising, weather data and

mobile mapping. The haptic "taps" are closer to your skin than other location-aware devices so they have even more of a personal connection to touch (Wilmott et al., 2018). Apps designed for the Apple Watch are strictly managed by Apple Developer human interface guidelines–only one typeface can be used and information must be designed in segments that pop up as small notifications; these are then scrollable as longer segments if the user wants more information. This demonstrates the level of Apple control in the experience of using the Apple Watch. Designers working within the guidelines can use small quick animations that operate when goals are achieved or as "quick glance" notifications. The animations must suit a "quick glance", according to the guidelines. The kinetic nature of a "quick animation" works with the haptic "tap" to flicker an alert "notification". In their article, "I am he. I am he. Siri rules: Work and play with the Apple Watch", Wilmott and Fraser challenge the notion that play is made out of daily tasks and question whether this makes our lives more efficient or less efficient. They also emphasise Leszczynski 's argument that "'big data becomes personalised, and the personal becomes big data – auguring new anxieties of control' (Leszczynski, 2015) over how, where and by whom these data are gathered and managed." (Wilmott et al., 2018, p. 80).

Wayfinding storytelling experiences already work successfully through notifications being sent from beacons to location-aware devices, including wearables. Jeffrey predicted that using wearables where the haptic response was felt even more by the body would form a more seamless relationship between digital wayfinding and the physical (Jeffrey, 2017, p. 522). To date there is not a lot of research into wayfinding design and wearables, but there is potential for creative ways for typography and storytelling to work in this space as urban wayfinding experiences.

New needs for street signage have arisen out of our digital habits. Public notices and awareness signs are already adapting to include signage systems for the notification of data collection. Sidewalk Labs developed a system of icons for the public notification of data collection in Toronto but this never eventuated into physical signage because Toronto cancelled the sidewalks project due to the issues around privatisation and control of data (Warburton, 2020). Sidewalk Labs have since developed these into a set of concept guidelines that they term a "taxonomy of concepts" provided as an open-source system [17].

Mobile mapping and the capacity for narrative

Mobile mapping[15] has been described as a "cartesian container" (Meisterlin, 2019, p. 251) with an inferred infinity, in which we can embed ourselves as the narrator (Gibson, R. 2014). Being a large part of the way users wayfind in a city and an integral wayfinding tool, mobile mapping has the potential to be investigated more for its capacity to contain narratives. Clancy Wilmott, who writes on mobile mapping, discusses the fluidity, perceived infinity and the shifting state of the digital map, how it fluidly morphs and shifts and updates itself as it is viewed, "a map that is not fixed but is always becoming" (Wilmott, 2020, p. 12). Ross Gibson, artist and academic in creative and cultural research at the University of Canberra, extends this by proposing that the concept of knowing where one is at all times should be reconsidered as

16 Sidewalk Labs was a Google company, now owned by Alphabet: https://www.sidewalklabs.com/insights/how-can-we-bring-transparency-to-urban-tech-these-icons-are-a-first-step

17 'Mobile mapping' is used to summarise GIS and GPS enabled digital mapping applications (such as Google Maps, Waze, we3words, Apple Maps) that work on location-aware devices, primarily on mobile phones.

a "flowing, ever contingent and shifting agglomeration within a relational field" (Gibson, R. 2014, p. 253), arguing that mobile mapping systems are always in a state of change. He discusses mobile mapping as a combination of cartographic survey knowledge and narrative-making, a narrative where the user becomes the protagonist. Gibson emphasises this argument by citing Kurgan in *Close Up at a Distance: Mapping, Technology, and Politics*: "we do not stand at a distance from [the] technologies that support geographical information systems. Rather we 'are addressed by and embedded within them'." A map is a significant and integral part of urban wayfinding systems and in a static form, that is, presented over a series of wayshowing monoliths, the map exists as a "subject" (Gibson, R. 2014, p. 251). Gibson argues that in dynamic form:

> Once you have become a participant and have etched some of your experience into a cartographic system, thereby changing it with your actions, then the system is dynamic, reactive and not separate from you. It is not simply an object to your subject. ... Moreover, an interactive map stores a *narrative* that involves you as a character. Indeed with each newly recorded visitation from you, the narrative grows around your character. And while you might want to regard this character as the protagonist in the mapped setting, you know in fact that computationally you are no more special than the legion of other data-packages – animal, vegetable, mineral and commercial – that make up the network you are negotiating. (Gibson, R. 2014, p. 251)

In a chapter in the 2019 book *Ways of Knowing Cities*, Wilson writes on "Maps that move". In this, he discusses not mobile GIS-based mapping but animated maps, adding to this idea by describing how animated maps might also be a useful tool in highlighting cartographic representation and in seeing maps differently:

> The static map tends toward closure, space as stasis. Perhaps "maps that move" might mobilize design to think about the intervention in cartography differently, as shifting the ways the world is experienced and represented, to be for space in all its liveliness, surprise, and disruption. (Wilson, 2019, p. 247)

Words as a way of navigating in mobile mapping

What3words is a digital mapping app and precision-based navigation tool that structures navigation by dividing the world up into a grid using three unique words in 3m x 3m squares. Constructing space through alternatives to street names and numbers, the app is an effective tool in places where street names or numbers do not exist. It is interesting from a mapping perspective and in how we address and navigate but leaves out association to place via memory or meaning. Replacing street names with random words is a missed opportunity to work with naming in a cultural, local and historical way.

Mobile storytelling

Since the beginning of the 21st century there have been research, art-based projects and storytelling projects that explored the potential of the mobile phone or location-aware devices to tell site-specific narratives (Farman, 2013, 2015). These are often wayfinding experiences that comprise but are not limited to audio or trans-media based, AR mobile storytelling and soundscapes or sound walks. Jason Farman, who researches the area of mobile technologies, digital storytelling, digital performance art and surveillance, terms these "mobile story projects". The project *34 North, 118 West (2002)* was a pioneering piece in site-specific mobile storytelling and is credited with being the first project to work with geo-located storytelling content in this way (Oppegaard & Grigar, 2013). *34 North, 118 West* was an unfolding audio experience, a site-specific narrative on the history of an old freight depot in downtown Los Angeles experienced through headphones and a PC tablet. Participants walked the space with a map and received fragments of information at different walking points (de Souza e Silva & Frith, 2013; Oppegaard & Grigar, 2013). Many mobile storytelling experiences have been designed for museums, parks, botanical gardens and councils, as art projects and in game design. This form of storytelling has enhanced the opportunity for storytelling to be experiences of simultaneously "reading and writing the city", of experiencing geolocated sound walks and "hybrid spaces" through AR storytelling and gaming (de Souza e Silva & Frith, 2013).

Farman sees the potential of mobile story-telling experiences to enhance the role that "ephemeral media" plays in telling the previously untold stories of place. He uses McCullough's definition of "ephemeral media" as the type of dialogue and content found in vernacular typography, in art and graffiti (McCullough, 2008). He explains how mobile storytelling can reveal the infrastructures that surround "grand narratives" in a city and can shift the participant's awareness or how spatial narratives are told (Farman, 2015, p. 110). Farman gives examples of art interventions in which the mobile storytelling reveals a story or narrative of a site that conflicts with the public commemorative signage or markers in place, giving another context to the way that site can be understood. His research also picks up on the fact that these experiences, like digital wayfinding, are often personalised. As an alternative to this, he provides a case study of an art intervention where the artist took a personalised experience (a dialogue in text messages) and turned it into a public experience by presenting it on a big screen, arguing that by shifting the dialogue from a single-use mobile encounter to a public dialogue in which the community could engage, "pulls the content from the original context and gets participants interrogating the role of the medium in these messages." (Farman, 2015, p. 113).

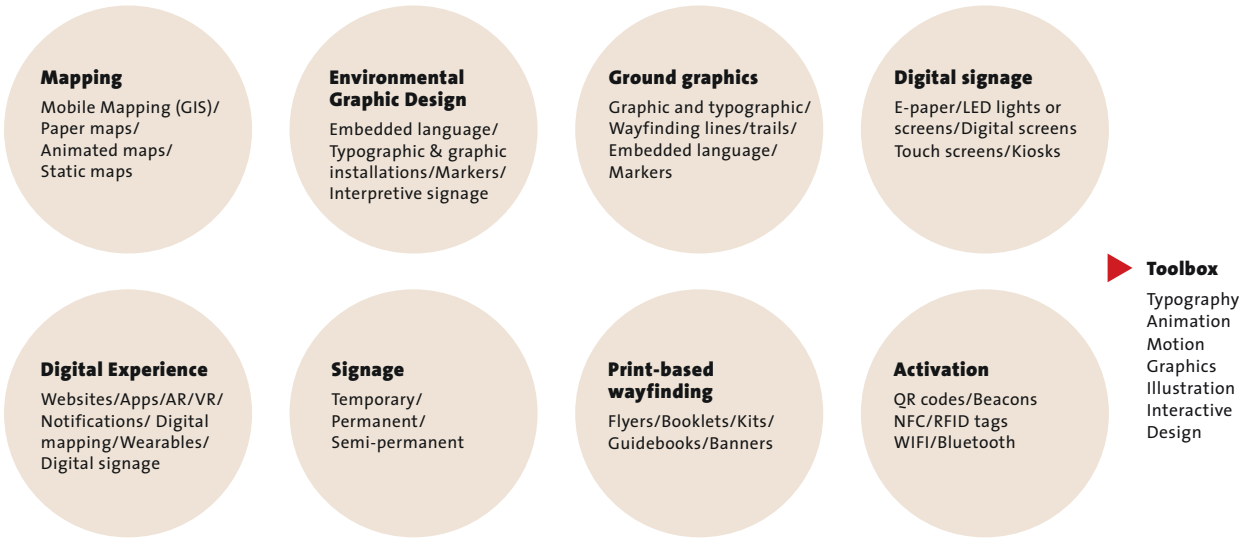


FIGURE 23
Visual communication design devices for wayfinding experiences.

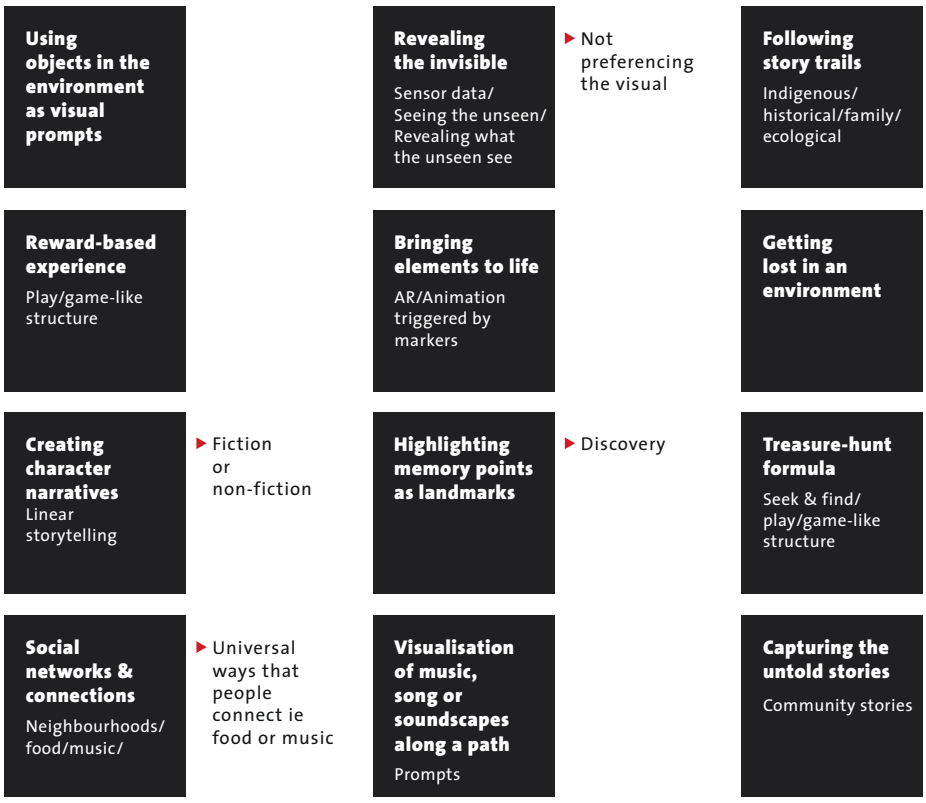


FIGURE 24
Possible ways to integrate storytelling into a visual wayfinding experience (a work in progress).

Exploring wayfinding storytelling from a visual communication design perspective

This researcher uses the diagrams opposite (figures 23 and 24) in her teaching so that students can reflect on the storytelling techniques that are used with wayfinding design experiences and the tools and mechanisms available to visual communication designers working in this field. This diagram is a work in progress and will continue to be updated.[18]

18 I observed that students in the projects I run in collaboration with the Sydney Living Museums are continuously drawn to making a game-like experience out of the brief based on a seek or find with a reward–based system. This led me to think about the other ways that storytelling can work in wayfinding experiences.

Conclusion

Moving away from situations where a route is pre-determined by city authorities as a walking, cycling or park destination and from city-wide large-scale systems and into the everyday, messy experience of getting to and from destinations and existing in a city, digital experiences can fulfil our wayfinding needs socially (through geo-social connections), by locating us (on mobile mapping and geo-located wayfinding apps) and by giving us directions (socially and through mapping routes). How in this context can wayfinding design that includes interpretive (historical, cultural and ecological) information about the city be experienced in the messy, varied and everyday experience of wayfinding, that is, not along a designed walk, a designed set of locations or destination points or in a space that is set aside by the council for a walk? How can the concrete, built-up areas in the historical early colonial areas of the city be dug up to reveal the landscape underneath and its ecological and cultural history? How can we peel back the layers to the land underneath, experience the original pathways, understand what should grow in this area? How might we add storytelling and interpretive responses into wayfinding schemes, a "learning as you go wherever you go", rather than their being add-ons to a designated park or walk?

> Instead of more gratuitous parametric modeling, we need to think about urban epistemologies that embrace memory and history; that recognize spatial intelligence as sensory and experiential; that consider other species' ways of knowing; that appreciate the wisdom of local crowds and communities; that acknowledge the information embedded in the city's facades, flora, statuary, and stairways; that aim to integrate forms of distributed cognition paralleling our brains' own distributed cognitive processes. (Mattern, 2017, p. 34)

This contextual review has examined the principles dominating the practice of urban wayfinding design in order to construct an argument for why a storytelling approach in wayfinding design is important. It is therefore important to this research to examine the wayfinding design and systems in the inner city of Sydney in connection with the "hidden logic" (D. Gibson, 2009, p. 44) of its ecological and environmental history, to put forward design ideas and approaches that address this hidden logic and explore ways in which this could be embedded into existing wayfinding tools and mechanisms to inform how we find our way in the Sydney city centre.

SECTION 3: TYPOGRAPHY IN WAYFINDING

Typography in urban wayfinding design has been defined variously as one of the "four forms of signage content" alongside pictograms, arrows and guidelines (Mollerup, 2013, p. 98); as an "urban graphic object" that "shapes behaviour in cities" (Harland, 2015, p. 370); as a device that operates to produce "a navigational system as well as meaning" (Drucker, 2013, p. 99) and as a lens through which to make the stories of a city legible (Banham, 2019). Banham, a typeface designer, academic and visual communication designer based in Melbourne, is referring here to Lynch's definition of legibility, namely, the way in which parts of the city can be identified, recognised and ordered into a type of pattern that can be influenced by memory and association to enhance its image. Typography is used as a fundamental part of wayfinding design to create systems for legibility, identity and orientation.

In this chapter, both definitions of the word "legibility" are referred to at different stages. The first is the urban design definition of legibility as defined by Lynch in the previous paragraph. The second is the definition in relation to the reader and to typographic practice. This encompasses the ability of a reader to decipher differences in letterform[19] in the context of wayfinding signage, to decipher letterforms in order to read words and sentences from different distances and angles, at an appropriate size, when travelling at speed, under different conditions and through different materials, such as the halation caused by LED signage (Arthur & Passini, 1992; Harland, 2011; Mollerup, 2013).

There is a considerable body of research from a typographic legibility perspective into letterform and typeface design for wayfinding design and its signage. It is easily accessible in scholarly articles and books, in government guidelines and on the SEGD website. The results of this research on letterform and type design are integral to the safety, connectivity, accessibility, disability measures and identity of successful transport and wayfinding design systems. This section is partially a contextual review of the historical and global role of typeface design and typography in wayfinding design and the beginnings of the analytical contextual survey on typography in urban wayfinding design in Sydney, the "*what is currently in place*" section of this research. Sydney's wayfinding systems and their typographic approach are examined and classified in this section and the next chapter.

19 A distinction between 'legibility' and 'readability' in typography is made by Baines and Haslam in their book *Type and Typography* (2005). They define 'readability' as the ability to decipher words and sentences (how people read) and 'legibility' as the ability to decipher differences in letterform (letterform and typeface design). (Baines & Haslam, as cited in Harland, 2011). Mollerup (2013) mentions that in everyday life these terms are used interchangeably (Mollerup, 2013). Sofie Beier uses the term 'legibility' to summarise both in her research in 'Reading letters: designing for legibility'(Beier, 2012). This research uses the term 'legibility' to mean both.

A critical analysis of typography in urban wayfinding

A plethora of visible language (typography and other graphic devices) surrounds the urban public built environment, from the naming of buildings to engineering markings on roads, graffiti on walls, road markings for traffic, timetables on LED screens, numbering systems on buildings and typography in advertising. Verbal/visual relationships are embedded in the streets and buildings of our cities, from commemorative monuments to wayfinding and highway signage systems,

advertising billboards, commercial retail awnings, civic signage, graffiti and vernacular type. Typography in the urban public built environment instructs, directs, navigates, educates, regulates and communicates in its various forms in wayfinding, architecture and signage. It plays a commemorative and declarative role on public monuments and has a role in public storytelling in public installations, placemaking and art.

Historically, typography was a term specifically used to describe type design and typographic principles that derived from a mechanical process or had an element of a mechanical system at its base. According to Ellen Lupton, who as an academic researcher and educator has written extensively on the field of typography, "Typography is what language looks like" (Lupton, 2010).

> Words originated as gestures of the body. The first typefaces were modelled on the forms of calligraphy. Typefaces, however, are not bodily gestures–they are manufactured images designed for infinite repetition. The history of typography reflects a continual tension between the hand and the machine, the organic and the geometric, the human body and the abstract system. These tensions, which marked the birth of printing letters over five hundred years ago, continue to energise typography today. (Lupton, 2010, p. 13)

Type design in Europe evolved out of the printing revolution of the 15th century and the first typefaces were modelled on calligraphic forms and the roman capital letterforms of roman inscriptions (capitalis monumentalis) (Shaw, 2015). Typeface design occurred much earlier in China, with the first typeface designed for ceramic movable type occurring in the 11th century (Hara, 2010; Mattern, 2017; Song, 2009). Printing with movable type was invented in China and advanced from ceramics to wood and then to metal in China and Korea before being introduced by Gutenberg in Europe in 1455 (Mattern, 2017; Sohn, 1959; Song, 2009). However, printing with movable type was largely not adopted in the east, where wood-block printing, which suited the calligraphic form, continued to thrive (Hara, 2010). Gutenberg's invention was an advanced movable type with an adjustable mould and matrix (allowing for variation in letterform size) (Dair, 2000, p. 7) and by casting type in a mix of lead, tin and antimony. This improved the durability of the type, making it suitable for mass production. Kenya Hara puts the reason that movable type was not widely used in the east down to the basic fact that it was:

> ... technically difficult and inefficient to mold tens of thousands of highly complicated characters. Furthermore, people's aesthetic preferences slowed the advance of the technology compared to the West; the Chinese preferred the precise and detailed woodcuts to the dull-looking characters the metal and ceramic typesets turned out. (Hara, 2015, p. 31)

Gutenberg's movable type provided the mechanical tools for the beginnings of mass production in printing and with it came a new profession of typesetters and type designers. The role of the typographer emerged in the early 20th century, when independent designers started taking control of publication design and publishing from master printers (Kinross, 2004, p. 68). Kinross attributes the first such roles to Stanley Morison and Francis Meynell.

At its core, typography is infinite variations of an alphabet, a way of visualising language and an investigation into verbal and visual relationships; it is visible language. The field of typographic research in relation to wayfinding design has largely been based around type design and letterform design for legibility. (Mollerup, 2013). Of relevance to this research are the typographic principles that can be used to communicate storytelling and information; nuances of spoken engagement, juxtaposition, hierarchy, repetition, colour, "pattern recognition" (Banham, 2019, p. 7) "contrast and concord" (Dair, 2000), silences and the use of text as image. Text as image is discussed in Chapter 6. Also relevant to this research is the way in which typography as a storytelling system could link signage in the environment and digital wayfinding.

Typography contributing to the image of the city

Typography contributes to the "image making" of a city (Harland, 2015). This research draws on Harland, an environmental graphic design scholar and practitioner, who argues that "urban graphic objects" (Harland, 2011) should be considered as part of urban design thinking like "the products of architecture, landscape, architecture and city planning and civil engineering" (Harland, 2015, p. 371), and he provides a framework for examining the impact of visual communication design in the urban environment. Referring to Lynch's research in *The Image of the City* (1960), he identifies that typography plays a significant role in the "image making" of the urban, public, built environment and that it contributes to making a city, a place or a country legible. He demonstrates how typographic elements can be considered part of the Lynch-based model for wayfinding and discusses how large letterforms act as gateway signs, how typographic installations can work as landmarks and how type design contributes to the "environmental image of a city" (Harland, 2015, p. 381). In "Letters and cities, reading the urban environment with the help of perception theories", Gouveia et al. put forward a case that "typographic landscapes" should be considered a form of discourse. They argue, based on Lynch's theories, that typography "can act as indicators of urban flows (wayfinding) or as landmarks that identify and name city locations and therefore contribute to defining the city's information structure" (Gouveia et al., 2009, p. 345).

Typography in wayfinding signage schemes

Typography in the urban public built environment has different typographic principles and coded information for the different contexts in which it is used. Drucker's 2013 paper "Diagrammatic Writing" poses the question "How do structural relations participate in the production of meaning?" (Drucker, 2013, p. 87). She states that at its alphabetical base, through context and place, we can distinguish genre, typologies, orders before content.

> All writing is graphical, by definition, and the graphicality of all writing plays a part in the production of its legible and communicative, expressive, value. By reading stylistic codes, the place and situated-ness of an inscription that distinguishes formal monumental writing, informal graffiti, printed communication, official signage from each other and from other modes of writing, we are able to identify orders, genres, types of written language in a millisecond, long in advance of processing textual content. (Drucker, 2013, p. 91)

When discussing typographic principles for book design, Drucker explains, "The purpose of headers, footers, page numbers, margins, gutters, indentations, tables of contents, indices and every other bit of text and pretext is to structure our reading" (Drucker, 2014, p. 162). The typographic principles in signage systems in the environment have been designed and evolved over time to structure reading primarily from a legibility perspective. The "structural relations" (typographic principles) form the standard manuals for subways/roads and wayfinding systems and comprise colour contrast, scale for certain distances, letter spacing, word spacing, line spacing, words per line, lines per sign, sufficient x-height[20] of the lowercase letters, stroke width and modulation of stroke (Arthur & Passini, 1992; Harland, 2011; Mollerup, 2013). These typographic principles relate to the principles of wayfinding: hierarchy of place, reading speed, legibility, materiality and scale. Typeface development also plays a central role in identity through the "situatedness" and "stylistic codes" of its letterform design (Drucker, 2013, p. 91).

Jock Kinnear is the designer of the British road signage system and the Transport typeface. In his book *Words and buildings: the art and practice of public lettering*, he explores the relationship between how letters "sit on buildings", their form, their quantity and their relationship to the street (1980, p. 170). He states that legibility alone should not be the only criterion for lettering in the urban environment but that communication and appropriateness to the surroundings (that is, context) are of equal importance. Kinnear placed this field of lettering in the built environment between graphic design and architecture and argued that the "importance of lettering and place" (1980, p. 17) should be examined "not so much for its own sake but because it shows the value of the code we call the alphabet and the validity of dealing with this alone" (Kinnear, 1980). His study is primarily into the letterform on buildings, what he terms "voices of lettering", which he breaks down into categories of letter, style, content, material, size and position. The two main factors that distinguish this form of typography from print typography are, he says, "situation and size" (Kinnear, 1980). This research does not concern itself with the naming of buildings as this area has been researched extensively by Kinnear (1980) and Baines and Dixon[21] (2003). Rather, this research is concerned with wayfinding design in the public space.

20 X-height is the height of the lowercase letters in a typeface (based on the letter 'x'). A larger x-height provides better legibility for signage.

21 Phil Baines and Catherine Dixon's criteria for assessing type and lettering within the environment are based on the 'relationship of four main factors – letterform, placement or situation, scale and material.' (2003) Baines and Dixon use these criteria for the London Public Lettering Archive, of which they are the founders.

How we should think about and approach designing typefaces for the different aspects of our cities

Typeface[22] design on both a global and historical scale has become integrated with urban signage, architecture and wayfinding design to become an integral part of large global systems. As such, it is often an identifiable form of that system, designed specifically for legibility purposes and not associated with place. In contrast to this, certain typefaces or lettering have become associated with certain cities or an emblem or icon of those cities. Some cities use a global system and then embed in it a local typeface associated with their city or design a new typeface that characterises that city. Over time, some of these typefaces designed for wayfinding systems have become emblematic of the cities for which they were designed.

Following are diagrams (Figures 25–27) created by the author to define the global influence of approaches to typography in wayfinding systems and, in contrast to this, an examination of the wayfinding systems that are evident in the defined research area of the Sydney city centre.

The following categories were developed by analysing wayfinding signage in Sydney, using photo-analysis and observation methods on what is currently in place in the city (see Figure 27):

- road/traffic signage system (global/local system)
- subway/public transport signage system: train/bus/ferry/light rail (local system with global influences)
- pedestrian wayfinding/street signage (street signage at district level, Legible Sydney wayfinding at city level)
- wayfinding schemes for public spaces (parks at district level)
- interpretive signage and environmental graphic design (local landmarks and signage based on site-specific storytelling)
- public installations and monuments (local landmarks, includes site-specific storytelling)

22 A typeface is letterform design containing a full character range designed for mechanical or digital reproduction. Each character of a typeface is individually designed to create a consistent typeface design. A typeface usually contains a whole family of fonts, from italic to bold and can be as large as a superfamily containing multiple different weights and serif and sans serif versions.

Communication
Speed of reading
Legibility testing
Functionality of reading
Orientation
Navigation

NATIONAL BRANDING OR STANDARDISED SYSTEM FOR A CITY

National graphic identity for Qatar
Branding a Country
Logotype & Identity: Tarik Atrissi Arabic script

ROAD/TRAFFIC SIGNAGE SYSTEM

The US Road signage system
Standardised graphic language.
Typeface: Clearview by Don Meeker and James Monalbano

The British Road signage system
Standardised graphic language by Jock Kinneir & Margaret Calvert
Typeface: Transport

SUBWAY SYSTEM/ PUBLIC TRANSPORT SIGNAGE SYSTEMS

Rail Alphabet
by Jock Kinneir & Margaret Calvert

Paris
Metro Parisine by Porchez

Denmark
DSB typeface by Kontrapunkt

NY
Helvetica/ Standard

Toronto subway lettering

Amsterdam
Metro M.O.L. by Gerard Unger

Singapore
LRT typeface

Berlin
Transit by Eric Spiekermann

London Underground
Typeface by Edward Johnston. Three elements create the standardised graphic language: the roundel, a consistent colour palette & the typeface

PEDESTRIAN WAYFINDING/ SIGNAGE SYSTEMS

WalkNYC
Standardised graphic language for a NY standardised wayfinding system
Typeface: Helvetica
Design by Pentagram

Derby

Legible Moscow

Walk Rio

Legible Sydney
Frutiger

Legible London
Standardised graphic language.
Typeface: New Johnston

Bristol Legible City
Standardised graphic language. Bristol Transit Typeface

STREET SIGNAGE

Typeface Roissy – Frutiger
by Adrian Frutiger for the Charles de Gaulle airport

Prague
Enamel signs: production enhanced to suit typography. New typeface based on traditional lettering. Format standardised.

District of Westminister London Street Signage
Distinct format and use of typeface. Standardised graphic language.

Gentofte's Street signage – Denmark
Distinctive letterforms and use of large type within signage

CULTURAL WAYFINDING SCHEMES

National Parks in America
NPS Rawlinson Road Typeface

PLACEMAKING

Art Nouveau Metro Letterforms
by Hector Guimard

Stolpersteine stones
'Stumbling stones', a community-based monument to the Holocaust, first realised by artist Gunter Demnig in Cologne in 1992. Unique hand-forged lettering.

Minneapolis–Metro Letters
A Typeface project for the Twin Cities

Typographic matchmaking in the city: Propositions for a pluralist public space. Amsterdam/ Dubai Type design & installation project

Why Not Associates & Gordon Young
Embedding language in the city through typography. Typographic installation.

Wellington Writer's walk
Embedding language in the city through typography. Typographic installation: Catherine Griffiths

every thing every time
Smart city art project: Naho Matsuda

Emotional connection
to the viewer
Sense of place
Cultural and historical link
Identity of place
Navigation

▲
FIGURE 25
Mapping out city typographic design for wayfinding projects.

CATEGORISING WAYFINDING SIGNAGE AND SYSTEMS

Typography as a system for storytelling in urban wayfinding design

▶ ▶ ▶ ▶ Proposed areas of significance to this study.

Players in this space

Urban Planning
Urban Design
Visual Communication Design
Built Environment
Environmental Graphic Design
Architecture
Landscape Architecture
Engineering
Art
Signwriting
Graffiti art/
Anonymous participants
Advertising
Public lettering archive

Type of signage system

Public/private
Permanent/semi-permanent/
Temporary
Global/local system

Architectural signage

Naming
Placing
Personalising
Symbolic
Functional

Signs as architecture*
The lettering of city buildings
Building numbers

Civic signage/ Wayfinding systems

Identity
Instructional
Functional
Navigational
Informative
Regulatory
Efficiency
Safety
Naming
Storytelling

Pedestrian wayfinding schemes
Street numbers
Street names
Digital wayfinding

Transportation signage systems

Identity
Instructional
Functional
Navigational
Informative
Regulatory
Efficiency
Safety

Road signs
Subway signage systems
Cycle way signage
Traffic signs
Airport Signage

Lettering Misc.

Inscribed or in relief
Architectural
Historic

Commercial wayfinding

Events
Private gardens
Historic places

Public notices

Vernacular
Political
Regulatory

Physical signage
Digital applications

* Venturi, R., Scott Brown, D. and Izenour, S., 1977, (pg73) *Learning from Las Vegas: The forgotten symbolism of Architectural Form*, MIT Press, Cambridge, Massachusetts, and London, England

▲

FIGURE 26 ▶
Mapping out signs, signage systems and wayfinding systems.

Commemorative signage

Historical
Commemorative
Naming/placing
Symbolic

Memorials
Monuments
Inscriptions

Commercial signage/

Persuasive
Advertising
Identity
Ownership

Branding
Billboards
Advertising posters
Advertising signs
Banners
Commercial signs
Commercial building numbers

Maps

Orientation
Navigational
Imagemaking
Storytelling

Wayfinding maps
Subway maps
Digital maps

Interpretation

Placemaking
Art
Storytelling

Type in art
Public installations
Type in landscape
Architecture
Type in community public spaces
Environmental graphics

Satellite signage

Letterforms read from space

Vernacular type

Unauthorised
Unofficial
Expression of freedom of speech
Ethereal
Political

Altered signage
Naming
Tagging
Graffiti
Protest signs

Digital wayfinding

Multi-layered
Networked
Data-driven
Experiential
Non-linear
Multiple messaging
Dynamic content
Sensor driven

Kiosks/
Digital maps/
Digital applications/ websites/
Sensors/
Beacons/
QR codes/
Digital signage

Event signage

Experiential
Commercial
Informative
Communication
Marketing

Street banners
Events
Signage systems

FIGURE 26
Mapping out signs, signage systems and wayfinding systems.

CATEGORISING WAYFINDING DESIGN IN SYDNEY

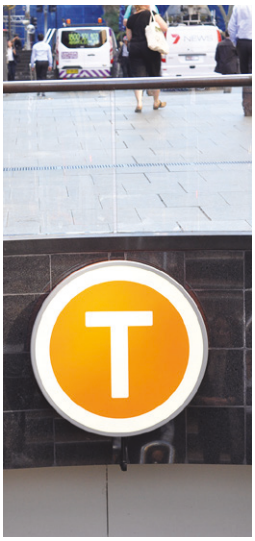
	Sydney trains/ ferries/buses	Australia road signage system	Legible Sydney
TYPOGRAPHY	  Typeface: *NewFrank* by Miles Newlyn Graphic language references global schemes	  Australia follows the metric version of the FHWA Series 2000 fonts developed by the US FHWA: Standard Alphabet	  Designed by Minale Tattersfield with City of Sydney Typeface: *Frutiger* Graphic language makes reference to *Legible London*
WAYFINDING CATEGORIES	**Subway/public transport signage systems** Global/local system	**Road/traffic signage systems** Global system with local influences largely from materiality and manufacturing influences	**Pedestrian wayfinding/ street signage** Global/local system: Legible wayfinding systems

FIGURE 27
Categorising wayfinding design in Sydney.

Can the interpretation and typographic approach to this be integrated back into the pedestrian wayfinding systems?

How do digital wayfinding systems work with these schemes?

Sydney street signs

Typeface: *Gill Sans*
Serif (on old signs) for the City of Sydney Signage
Iconic of the UK

Sydney park signs

Typeface: *Helvetica*
Use of local Gadigal language on signage

Interpretive signage

Environmental graphic design by Jacqueline Marony for Frost Design
Type assortment
Experimental approach to typography

Art and installations

Edge of the trees by Fiona Foley & Janet Laurence
Lettering

'I stay' by Jenny Holzer
LED running signage

Pedestrian wayfinding/ street signage

Street name signage at district level

Wayfinding schemes for public spaces

Gardens/parks/zoos

Interpretive signage/ environmental graphic design

Local landmarks based on site-specific storytelling

Public installations/

Local landmarks

FIGURE 27
Categorising wayfinding design in Sydney.

Road and traffic signage system (global/local)

Road and traffic signage is all systematically designed and part of a larger global system. Paul Shaw, an academic and historian on typography and lettering, who has written a number of books on the relationship of certain letterforms and typefaces to place, tells us, "The 1960s saw in the systematic design of signage for cities, highways, railways, subways and airports" (Shaw, 2011, p. 17). Berger, in his book for the SEGD *Wayfinding, Designing and Implementing Graphic Navigational Systems* (2005), informs us that the USA was the first country to create a unified legible road system in 1924, motivated by a "National Conference on Street and Highway Safety" that "resulted in the first *Manual of Uniform Traffic Control Devices* (MUCTD) [23] in 1935" (2005, p. 37). The initial typefaces used by this system took up a considerable amount of space, and this remained in place for years until the American type designers Don Meeker and James Montalbano worked on reducing the stroke width and produced "ClearView Highway" and "NPS Rawlinson Roadway" (Berger, 2005, p. 38). Counter size is also a key factor in the design of typefaces for legibility from a distance. Halation is created on reflective materials or in LED signage; if the counter is not large enough or if the letters are not spaced well enough apart, halation causes the letters to appear as though they have filled in and therefore cannot be accurately deciphered (Berger, 2005, p. 38). The letters also need to be widely spaced, the x height large and the ascenders and descenders neither too short nor not too long for reading at a distance (Mollerup, 2013).

This was followed by the British system, which was instigated by the photographic documentation of graphic designer Herbert Spencer [24] who, early in 1960, highlighted "the haphazard state of British road signage" (Morgan, 2015, para. 2). Driving from central London to Heathrow Airport, Spencer recorded "a plethora of signs commissioned by various bodies" (Morgan, 2015, para. 2). Following this, he published a photographic essay in *Typographica* magazine, of which he was editor, founder and designer, focusing on colour, typeface use and the use of symbols which ultimately paved the way for Jock Kinnear and Margaret Calvert to design the British road signage system of colour, shapes of signs, icons and arrows and the custom typeface Transport, that met legibility standards (Morgan, 2015). The typefaces ClearView Highway and Transport were designed to be read from highway distances and at high speed and are consistently updated and maintained through legibility testing to adapt to changes. The basic principles of the American and the British systems remain in place and have become the guiding principles globally. The graphic devices of road signage are so symbolic of the instructions they represent that we often do not even need to understand the language of the sign to determine what it is instructing us to do. The shape of the road sign, with its curved corners, its colours, its typestyle, where the type is positioned, the arrows, the numbers and so on are so familiar to us as a global system that we understand when we are being directed to a place, instructed on speed or welcomed into a city.

23 The documents containing the signage standards for US roads are held with the US Department of Transportation: the manual Standard Alphabets for *Traffic Control Devices* was prepared by the Federal Highway Administration. The manual contains rules on spacing, spacing charts, signage grids, letter to letter spacing and line space values.

24 Herbert Spencer (1924-2002) was a writer, typographer, graphic designer and editor who was the founder, editor and designer of *Typographica* magazine. It ran for 18 years, being published in two series of 16 issues from 1949 to 1967 and became a critical and reflective voice on 20th Century typography. He also studied type legibility at the Readability of Print Unit of the Royal College of Art and has written books on the field of typography.

Photos: Sean Monro

FIGURE 28
London Underground typeface designed by Edward Johnston. Photos of the original typeface and roundel (right) and the updated Monotype typeface (left).

Subway/public transport signage system

Subway signage generally references other systems globally but retains local identity. The predominance of sans serif as the typeface category of choice for significant infrastructure programs, in particular for subway, public transport, road and traffic systems and signs, has been attributed to its beginnings in the London Underground typeface designed by Edward Johnston in 1916 (Ovenden, 2016). Documented as the "longest serving ... corporate typeface" (Lucas, 2013), the success of the London Underground typeface in relation to its legibility and its contribution to the identity of the city then paved the way for typeface design to play a primary role in the identity of subway signage systems globally (Ovenden, 2013).

The London Underground typeface is arguably one of the most extensively discussed typefaces. Researched and analysed in great detail by academics, type designers, authors, journalists and type fans alike, it is widely distributed and recognised and currently used in varying contexts. Revised and standardised by the typographer Kono for the Underground identity manual in 1979 and for the whole of Transport for London (Ovenden, 2013, 2016) updated by Monotype [25] in 2016 (Monotype, 2016), it is also available as a licensed typeface [26] for general use. The distinctive features of the London Underground typeface that add character to the London Underground and the city of London identity and make it easily recognisable are its geometric form (round circular letterforms) and square block-like letterforms influenced by the roman capital letters and its idiosyncrasies derived from its hand drawn beginnings (Ovenden, 2016). Edward Johnston was a calligrapher, which is evident in the peculiarities like the diamond above the j and the i and the hook of the J and l of the typeface that are not evident on most typefaces (Kinnear, 1980; Ovenden, 2016).

The subway is an artefact of urban scale, an idealised environment in which it is easy to create order. A city is a much more complex piece of work. The London Underground typeface has now been integrated into all aspects of London's transport. The typographic principles for Transport for London (TfL) [27] are strictly maintained through design standards documents and there are mandatories for how to set text for all

25 Monotype developed the typeface version TfL Johnston for corporate use.

26 The typeface foundries P22 and ITC have released these versions for general use: P22's Underground types and ITC Johnston (licensed).

27 The TfL design standards have their beginnings in the Carr-Edwards Report (1938), which with its accompanying drawings arguably represented the first attempt to compile a manual of graphic standards for an organisation, certainly for any transport organisation. (Ovenden, 2013).

communications and signage. TfL has created its own legibility policy in consultation with the Royal National Institute for the Blind (RNIB), and has "developed a clear print strategy for setting type in a way that makes it accessible to many visually impaired people." (Transport for London, 2018, p. 2). This governs the typographic principles of all signage and communication for the TfL. The Johnston typeface has been letterspaced (spacing between characters) and word spaced (spacing between words) to fit this policy and no deviation on the spacing or the letterform is permitted. There are strict guidelines in regards to signage for line spacing, size restrictions and legibility of type, and colour. All typographic considerations for digital display, such as grid and font, are also stipulated in the design standards.

Subway systems are now largely the domain of the sans serif typeface. Typeface design has played a significant role in this area since the Johnston typeface unified the underground brand. In 1973 Adrian Fruitger designed the Metro Alphabet for the Paris Metro, and in 1997 Porchez's typeface Parisine replaced it. Erik Spiekermann and Christian Schwartz designed a system of typefaces in 2009 for the Deutsche Bahn (the German state railways); Gerard Unger designed M.O.L. in 1974 for the Amsterdam Metro and Kontrapukt designed a typeface in 1995 for the DSB (Danish Railways), loosely based on Knud Valdemar Engel's street-sign typeface. To most of the general public the difference between one of these sans serif typefaces and another would not be obvious until pointed out but this author argues that at a city level, the scale and repetition of these letterforms start to create an urban identity that forms an identity with place. Each of these projects was undertaken to ensure legibility and each project contributed to the identity of that particular city through attention to letterform development.

London has been credited with a London letterform based on the prevalence of the Gill Sans and Johnston typefaces, which are now amplified by their use in all TfL signage and the *Legible London* scheme. Both are geometric sans serif, designed in the same time period and heavily influenced by roman capital letterforms (Ovenden, 2016, Banham 2019, p. 49). While the Johnston typeface dominates all transport and wayfinding signage in London, Gill Sans (designed by Johnston's pupil Eric Gill, a lettering and inscription artist) is prevalent in architectural naming and commercial shop front signage (Ovenden, 2016).

Johanna Drucker (2010) asks us to reconsider signage systems through a cultural framework. She proposes an alternative model for a typology on signage, one based on the "social relations of communicative exchange"(p. 137) that would present how the "models of cultural order were constituted through their material and spatial expression" (2010, p. 136) to highlight power relationships of ownership of space. She argues that historically, signage has not only had "practical functions" but has also "served to enunciate power relations through the way the text marks and is perceived in the landscape" (Drucker, 2010, p. 136) and later questions, "Who speaks the organizing vision of roads and highways? From whose point of view are distances or directions given?" (Drucker, 2010, p. 148).

She put forward this framework before the uptake of digital wayfinding but it still relates strongly to large-scale wayfinding physical signage schemes and has been a guide to the way signage is critiqued in the upcoming chapters.

Drucker argues that street signs as a system need to be understood and critiqued through a cultural framework for creating an alternative signage typology:

1. their material properties (style, materials, site, language)
2. the expression of conceptual models on which urban space is structured (and the way these graphic schemes express cultural and historical attitudes of spatial order and organisation)
3. any relation to scopic regimes created as an effect in the built environment (that structure power relations through degrees of access, point of view, position and movement), and
4. signage activity as an enunciative system (creation of subject positions and power relations constituted as language acts) (Drucker, 2010, p. 139)

Typography and city identity through digital and place-based storytelling:

The advent of digital signage and emergent digital technologies has meant that typography can be used as a device for a much wider role than static signage. In 2003, in the Twin Cities of Minneapolis and Minnesota, the University of Minnesota Design Institute commissioned a typeface competition to "express the character of the city" (Littlejohn, 2003, p. 24). The winning design by Erik van Blockand and Just van Rossum of LettError was a variable typeface which had many alternatives to each letterform character. Users could alter the typeface digitally to change its form. A website version of the typeface was also created to feed from city data such as temperature and windspeed and the typeface dynamically changed its form in response to the data (Littlejohn, 2003). It raised the question during the judging, "Could the physical Twin Cities influence this typeface rather than the typography capturing something about the Twin Cities?" (Littlejohn, 2003, p. 147). While this project was used primarily in online and print publications, the typeface created new ways of thinking about typographic possibilities for wayfinding signage.

Moving away from typeface design, Banham describes a project in his 2019 thesis called Elm Trees, in which the council used emails to record community stories of a set of elm trees in a Melbourne park that had become old and needed to be replaced. These stories were then reinterpreted by Banham as typographic signage in place (Banham, 2019, p. 117).

As mentioned in the first section of this chapter, Mollerup demonstrates case studies in his book and includes many examples of wayshowing that combine large elements of environmental graphics or typographic installations as part of wayfinding design and that also add to the wayfinding experience for the user (Mollerup, 2013). In these

examples, physical signage was expanded into ground graphics, embedded markers, wall graphics, ceiling graphics and large text as free-standing sculptural form. Large scale was often used to great effect, exemplifying how visual communication designers effectively used graphic and to a larger extent typographic devices as visual poetic devices. They explored verbal and visual relationships on a large scale to aid wayfinding in the built environment, both indoors and outdoors, thus demonstrating how typography and graphics can be used experientially.

It is also important to note that at national level, a typeface designed specifically for a city is generally an exercise in city branding (Mattern, 2008). Shannon Mattern in her 2008 article "Font of a Nation: Creating a National Graphic Identity for Qatar" analysed the difficulties in this approach to designing a typeface for place when it is done at a national or city-based branding level. She argues that at national level it commodifies and does not accommodate diversity; instead, it can homogenise and fetishise local identity (Mattern, 2008, p. 494).

In his 2016 book *Characters: cultural stories revealed through typography*, Banham takes a different approach and explores the significance of the narrative behind existing and historical pieces of letterform-based signage in the City of Melbourne, and the historical and cultural and social narratives behind these "characters" (Banham, 2011). The book aims to reveal "how the life of a city can be viewed through its letterforms and more specifically, the most public of all typography, its signage" (Banham, 2011, p. 18). He argues that this approach and enquiry could be applied in any city to enhance its storytelling. His study is a recording of what did exist and still exists. In his thesis Banham discusses the way his practice as a typographer over many years has enabled a "typographic way of knowing" (Banham, 2019, p. 7). This he describes as the ability of a typographer to "recognise underlying familial relationships between sets, patterns, and repetitions" and uncover and amplify place-based narratives which connect to larger political, social and historical dialogues. (Banham, 2019, p. 9).

Conclusion

This chapter has examined typography's role in wayfinding design as an overview of its historical and global context. The focus has been on the development of typefaces for integration into urban wayfinding design, how this integration has evolved and the key role typography within wayfinding has played in providing cities with legibility, orientation and identity. This chapter has also considered the relationship of typography in wayfinding to the cultural specificity of a city and this is continued in the next chapter in its critique of Sydney's wayfinding systems. In the practice-based research, typography is investigated as a system for storytelling in urban wayfinding design.

The examination of typeface design in wayfinding from first a global and then a local perspective led to categories of wayfinding signage in the site-specific area of this research, the Sydney city centre. In the next chapter, this classification is used to inform the analysis of the contextual survey in wayfinding in Sydney.

CHAPTER 4

Contextual Survey: Sydney wayfinding

All cities communicate messages – functional, symbolic, and persuasive – to people as they move about. (Venturi et al., 1972)

FIGURE 29
Photo documentation.

FIGURE 29
Photo documentation.

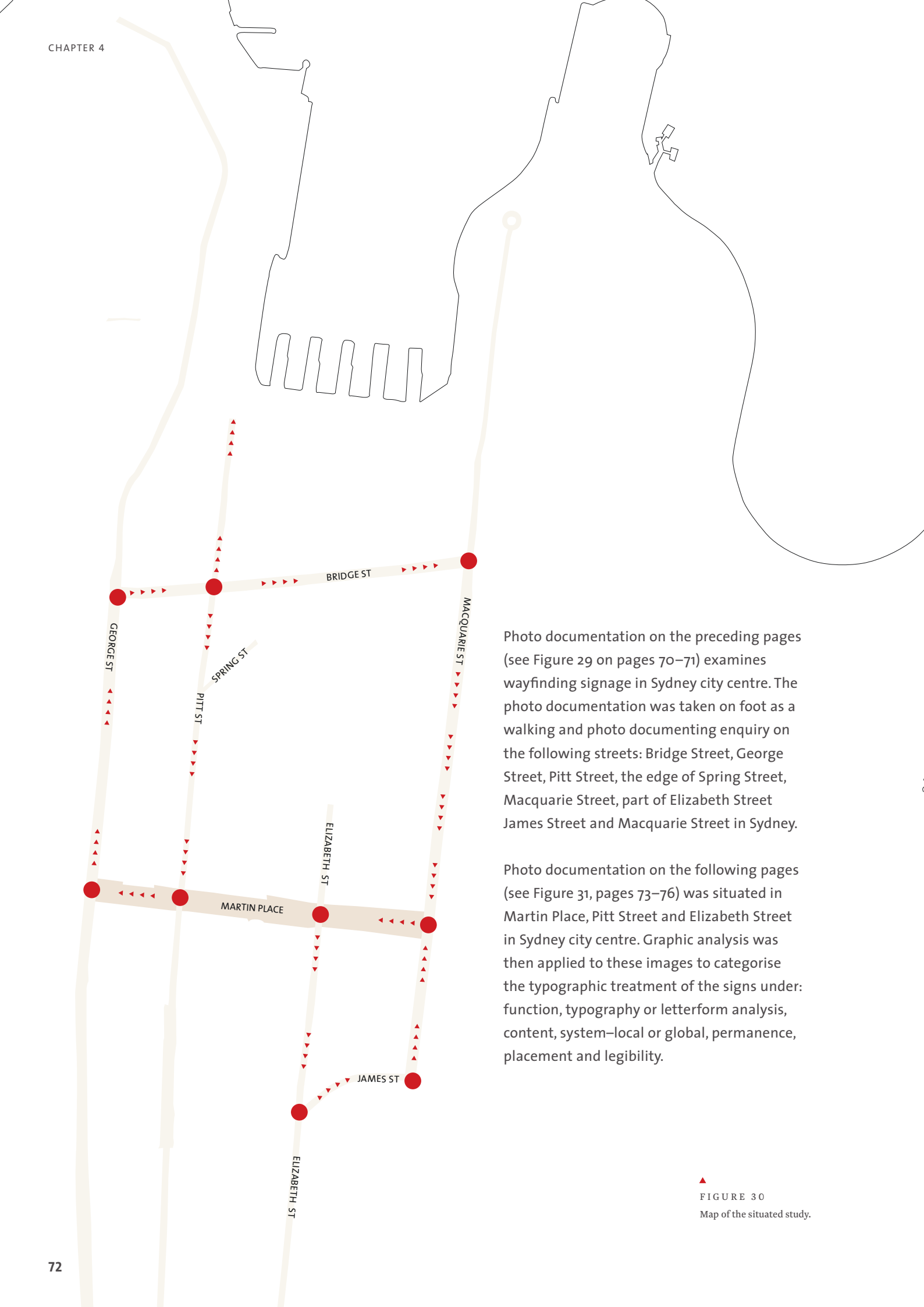


Photo documentation on the preceding pages (see Figure 29 on pages 70–71) examines wayfinding signage in Sydney city centre. The photo documentation was taken on foot as a walking and photo documenting enquiry on the following streets: Bridge Street, George Street, Pitt Street, the edge of Spring Street, Macquarie Street, part of Elizabeth Street James Street and Macquarie Street in Sydney.

Photo documentation on the following pages (see Figure 31, pages 73–76) was situated in Martin Place, Pitt Street and Elizabeth Street in Sydney city centre. Graphic analysis was then applied to these images to categorise the typographic treatment of the signs under: function, typography or letterform analysis, content, system–local or global, permanence, placement and legibility.

▲
FIGURE 30
Map of the situated study.

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans + City
Council logo + numbering
Local/Global system
Naming/Permanent

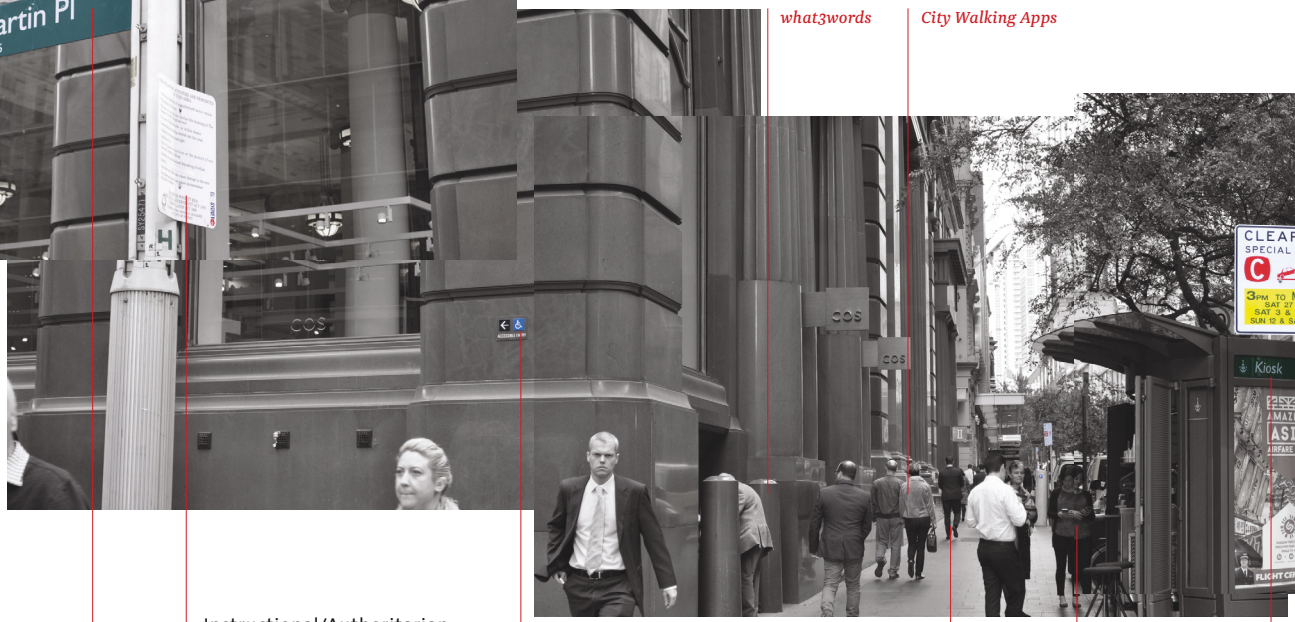
Instructional/
Notification
No-smoking awareness

Safety/accessibility
Legible/Permanent
Typeface: Helvetica

Wayfinding
Link to digital mapping

Legible Sydney signage
Local/Global system
Legible + accessible
Typeface: Frutiger
Naming/Permanent

what3words *City Walking Apps*



Instructional/Authoritarian
Public notice: Pedestrian

Haphazard typesetting
Semi-permanent

Disability/Accessibility
Pedestrian

Legible/Permanent
Small scale from distance

what3words *Google Maps*

Information/Public Amenity
Kiosk sign

Naming/Temporary
Interchangeable

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans + City
Council logo + numbering
Local/Global system
Naming/Permanent

FIGURE 31 ▶
Photo documentation
and graphic analysis.

Train station gateway signage
Typeface: New Frank
Local/Global system
Location naming

Public Transport–bus wayfinding & timetabling

Typeface: New Frank
Local/Global system
Location naming

Instructional/ Notification

Public awareness
Legible

Traffic/bus sign:
Local/Global system
Poor legibility

Parking signs:
Local/Global system
Poor legibility

Traffic sign:
Local/Global system
Poor legibility

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans +
City Council logo +
Numbering
Local/Global system
Naming/Permanent

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans +
City Council logo +
Numbering
Local/Global system
Naming/Permanent

Directional/Addressing
Pedestrian & Traffic

Street name sign (wall):
Local/Global system
Naming/Permanent

UBER

Apple Maps

Taxi GPS
Navigational system

Traffic sign: Clearway

Local/Global system
Poor legibility

Waze

Traffic sign: Clearway

Local/Global system
Poor legibility

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans + City
Council logo + Numbers
Local/Global system

FIGURE 31

Photo documentation
and graphic analysis.

◀ FIGURE 31 ▶

Photo documentation and graphic analysis.

▼

Public Advertising
Temporary

City Council
Place naming/Posters
Council branding

Instructional/Authoritarian

Public notice: Pedestrian
Haphazard typesetting

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans + City Council logo + numbering
Local/Global system
Naming/Permanent

Instructional/
Authoritarian
Notification

Public awareness
Legible/Permanent
Local/Global system

Directional/Addressing
Pedestrian & Traffic

Street name sign:
Typeface: Gill Sans + City Council logo + numbering
Local/Global system
Naming/Permanent

Wayfinding + street or place naming

Legible Sydney signage
Local/Global system
Legible + accessible
Typeface: Frutiger
Permanent

Directional
Naming

City Amenity:
Legible
Local/Permanent

Instructional/Notification

Public surveillance awareness
Safety/accessibility
Legible

Instructional

Public notice: Pedestrian
Haphazard typesetting
Semi-permanent

Information/Public Amenity

Flower sign:
Naming/Council advertising

FIGURE 31
Photo documentation and graphic analysis.

Instructional/Authoritarian

Public notice: Pedestrian
Haphazard typesetting

Built-in GPS navigational system

Instructional /Accessibility

Public safety
Legible

Google Maps AR

Google Maps Street View

Wayfinding/Public Amenity
Link to relevant information online

Legible Sydney signage & Taxi Stand
Local/Global system
Legible + accessible
Typeface Frutiger

Wayfinding

Legible Sydney signage & Taxi Stand
Local/Global system
Legible + accessible
Typeface Frutiger

FIGURE 32

Photo documentation.

FIGURE 32
Photo documentation.

CONTEXTUAL SURVEY: SYDNEY WAYFINDING

When the research is focused on the practice-based components, the writing remains mostly in the first person.

Photo documentation & graphic analysis as a method

This contextual survey uses photo documentation followed by graphic analysis as a method for analysing the wayfinding signage and typography in this research. My process was to photograph and record the street signage in a defined area in the Sydney city centre (see Figures 29–34), then graphically highlight the wayfinding signage, and typeface and typographic treatment by desaturating the other aspects in the image.

The graphic analysis sets out to document and examine the wayfinding signage in the research zone to illustrate current approaches to typography in its infrastructure. Phil Baines and Catherine Dixon's criteria (Baines & Dixon, 2003) for assessing type and lettering in the environment are based on the "relationship of four main factors – letterform, placement or situation, scale and material" (Baines & Dixon, 2003), criteria that they used for the Central Lettering Record [28] archive, of which they are curators (Baines & Dixon, 2017). This study does not analyse the scale or material in detail because it is not concerned with the materiality of the signs, the product design or the print and production. Scale is noted merely in terms of position, legibility and in relation to human height. In their study *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*, Venturi et al. used the categories of content, form, function, location, size, colour, structure and method of construction to analyse signs (1972, p. 80). This research borrows from both these resources to form the categories of function, typography or letterform analysis, content, system–local or global, permanence, placement and legibility [29] (see Figures 29–34).

28 The Central Lettering Record is an archive primarily for teaching purposes held at Central Saint Martins in London. It was set up in 1963 by Nicolas Biddulph and is a collection of photo-documentation of lettering and artefacts (print and type specimens, books, drawings and signs) (Baines & Dixon, 2017)

29 Legibility in relation to the reader and to typographic practice: the ability of a reader to decipher the differences in letterform and in respect to signage to accurately read words and sentences from different distances, when travelling at speed and under different conditions and on different materials, e.g., the halation caused by LED signage.

FIGURE 33 ▶
Photo documentation.

What this does not study

This is not a study of Sydney's traffic signs, although they are relevant to this research to highlight and analyse their wayfinding and typographic aspects. They are part of the research because they are a significant wayfinding system and compete heavily with the pedestrian signage. In the same way, this is not a study on how these traffic signs could be improved.

Sydney traffic signs are based on global systems but contain local influences, particularly material influences, due to their manufacture and the manner in which they are put together graphically. Currently they show little regard for typographic principles of hierarchy, word spacing, letter spacing and how much information on one sign is legible. Transport for NSW has come to recognise just how illegible its parking signs are through ongoing contested parking fines and has begun an online campaign to "report a parking sign"[30]. The whole system needs to be re-thought for legibility[31] but this author argues that this should be done through a typographic research focus.

30 https://www.service.nsw.gov.au/transaction/report-parking-sign

31 Legibility in relation to the reader and to typographic practice is defined as the ability of a reader to decipher the differences in letterform and in respect to signage to accurately read words and sentences from different distances and when travelling at speed and under different conditions and from different materials, e.g., the halation caused by LED signage.

For this study, I chose not to look at vernacular lettering (ephemeral typography), except when studying how it has influenced type design. However, I do acknowledge the enormous contribution of vernacular lettering to the field of typography, a field already saturated by research and popular design. Lettering in the environment is an online phenomenon; Instagram, for example, is flooded with imagery. Nor is this research an investigation into the history of lettering in the inner-city of Sydney, although this was a consideration; after an analysis of the area, it appeared to be an irrelevant task as there was little typographic history or vernacular type in this area. Phil Baines and Catherine Dixon have documented lettering in the environment from a European and, in particular, the British perspective, with their public lettering walks (Baines & Dixon, 2002, 2012) and their books on the subject. They also contribute heavily to the twitter account #Font Sunday, which is run by the Design Museum in London, and collects lettering and typographic images under weekly themes. This is also not a study into typography used in advertising, for commercial, branding or private communication purposes, nor a social linguistic investigation into typographic landscapes. Rather, this study remains focused on wayfinding systems and their design.

What is currently in place

This is a contextual survey that investigates the role of typography in street signage for wayfinding in Sydney's city centre. The process of the enquiry was to map out the walk I was about to take, annotate what I thought might happen, walk it and annotate what did happen or what things shifted. I then documented what was currently in place in the style of Herbert Spencer, who documented the state of British road signage.

AIM

I began my fieldwork by investigating what was currently in place in four of Sydney's principal streets – George Street, Macquarie Street, Bridge Street and Martin Place. At the time of photo-documenting this space, George Street was closed to both traffic and pedestrians due to the development of a new light rail system. As a result, Pitt Street also became part of the documentation, as did Spring Street. The aim of these black and white studies was to highlight the design of the wayfinding signage created by the NSW Government and the City of Sydney that was public facing. The NSW Government controls the traffic and road signs, including those for public transport, and the City of Sydney controls the Legible Sydney and street name signage.

As previously mentioned, this practice-based research analysis followed the photographic documentation and graphic analysis studies of Herbert Spencer who, early in 1960, highlighted "the haphazard state of British road signage" (Morgan, 2015, para. 2). In this research, I recorded the signage on foot in a style reminiscent of Phil Baines and Catherine Dixon's public lettering walks (Baines & Dixon, 2002, 2012).

FIGURE 34
Photo documentation.

WHAT I EXPECTED TO FIND/WHAT I DID FIND

My expectation on this walk is that I would find examples of interesting letterform that could start a Sydney archive, in the tradition of the Central Lettering Record held by Central Saint Martins, London.

The walk produced very little in the way of interesting letterform for potential archives. Most typefaces are existing global typefaces and there are very few examples of lettering. In this analysis I did look outside my defined area of research at the possibility that a Sydney typographic archive could be a result of this reserach.

I expected to document the haphazard nature of Sydney's traffic signs and the illegibility in typographic layout, structure and letterform.

What took my attention was just how many signs were traffic focused, competed with one another and with the pedestrian-based signage. There were instances where a very large number of signs were situated on one pole. The street signage that was pedestrian focused was generally designed to integrate with the environment but there was room for more identity, particularly in the choice of typeface and typographic hierarchy. A lot of the identity in these systems derived from global systems

My expectation of this walk is that I would find letterform as stimulus for how I could think about alternatives for typographic systems for wayfinding within the environment.

Analysing this signage has made me consider how digital wayfinding could integrate more with physical wayfinding in this area.

I also expected to find a reasonable amount of heritage and culturally-based signage.

There was a large number of heritage-based wayfinding systems currently in this area, as signage communicated in the public space. The Museum of Sydney has some interpretive signage in its forecourt space, as did the gates to the Botanical Gardens and there were a lot of heritage-based hoardings put up by the City of Sydney. There was also a system of green circular signage about the history of architecture and buildings. There was some old fading heritage signage in Jesse Park and the new brown park signage system designed by Frost Design across the City of Sydney area that includes an element of heritage or cultural storytelling and Gadigal language. There is a Welcome to Country sign when walking towards the Opera House which also works as an audio gateway sign.

▲
FIGURE 35
What I expected to find and what I did find.

INSIGHTS

What happened in the process of graphically analysing was that I began to analyse these signs from a wayfinding perspective, not just a typographic one. It became important to the analysis to identify what wayfinding role these signs had. This analysis covered local versus global relationships, whether the signage was permanent, semi-permanent or temporary, whether it was for traffic or pedestrians and what linked up to a digital network or digital mapping. They followed the wayfinding archetypes that I set up in the Chapter 3, Section 3 of this research and made me re-evaluate them. This made me aware that public notices and awareness signs needed their own category.

The analysis also made me aware that there was very little signage that communicated the ecological history of the area apart from some very dated signage at the Jesse Street Gardens.

I was conscious that this form of analysis was somewhat dated as it analysed wayfinding only in the physical domain, not the digital. It therefore felt necessary to start imagining the wayfinding mechanisms in place that were invisible to the naked eye of the observer (or in this case the photographer). These digital wayfinding systems have been discussed in the Contextual Review. The analysis shown in Figure 31 therefore imagines the person who is using Google Maps, the driver using Waze or a built-in GPS navigation system, the pedestrian using Apple Maps, the tourist using a city-walks app, a person using what3words and someone ordering an Uber. This emphasised to me that there needed to be a new set of categories or principles for the ways in which we wayfind digitally that can correspond to those that remain in the physical signage domain.

Learning through walking and observation, then graphically analysing and re-imagining this inner-city Sydney space as a site used in many of the digital wayfinding tools currently in place and as a second, imagined, layer of information, enabled me to make connections between the physical signage and the digital wayfinding. This insight made me think about the future of many of these street signs and the potential of their being replaced by a digital process, such as a digital sign or an app, by AR through Google Maps or a GIS/GPS mapping system, or to become redundant altogether because of self-driving cars. The advent of self-driving vehicles opens up another question of what type of city signage we will need for pedestrians.

In the way that Herbert Spencer's work paved the way for the British road signage, this exploratory work helps to highlight the fact that there needs to be an extensive audit of current street and traffic signage in Sydney in light of the new infrastructure needs of the city, so that there is a greater relationship between the digital and the physical. This author argues that there will always be a need for wayfinding signage in the physical domain for accessibility and disability and for those who cannot access digital wayfinding. However, the ways in which we navigate ourselves around are already changing and there are interesting opportunities to investigate as to how this might look.

FURTHER REFLECTIONS TO MOVE FORWARD

Analysis of the relationship between the physical and the digital in this area led me to the following insights:

- street names and numbering are used to navigate in most GIS/GPS navigation systems from both a pedestrian and traffic focus, apart from applications like what3words but there are no relationships between the visual appearance of street signs in Sydney and digital mapping.
- authoritarian public notices are often not designed typographically for legibility or identity and there is no system in place. However, there is potential here to combine them through digital signage with no smoking, surveillance and data collection information.
- *Legible Sydney* signage has a local identity, is legible and prioritises information to those with accessibility and disability wayfinding needs. It does not, however, link to its own digital mapping system and even though it does provide a comprehensive accessibility and disability digital map, this bears no visual resemblance to the physical signage.
- Apps such as what3words start to raise questions about how we navigate through digital mapping and provides a new alternative to meet the needs of accessibility, safety and finding your way quickly and effectively.

This all led me to think about how the systems in place influence the way we wayfind and navigate in this area, how wayfinding could be re-configured by paying attention to aspects of the historical ecology and environment and how all this influences the way we wayfind and navigate in this research area. In this inner-city Sydney area, there was very little that communicated its ecology, historical or current. For that I had to be taken on a tour around the Botanical Gardens, but they themselves require a very different wayfinding enquiry.

In the Contextual Review, Chapter 3, I reviewed how signage typography can be analysed for its legibility, communication and identity (Baines & Dixon, 2003; Kinnear, 1980) and how wayfinding design can be examined according to how it shapes behaviour in cities (Arthur & Passini, 1992; Berger, 2005; Mollerup, 2005). Shannon Mattern examines from a media studies perspective "how a city's tools of administration shape its administrative practices" (Mattern, 2017, p. 49). The photo-documentation and graphic analysis of the inner city of Sydney in this research is an attempt to map the wayfinding signage in this area and to investigate with what other systems, global and local, these signs interrelate. It highlights how these wayfinding mechanisms exist as "tools of administration practices" (Mattern, 2017, p. 49) for local and state government. Mattern also asks the question in her 2013 article "Infrastructure Tourism": "Can we devise ways to map these systems so as to reveal … how they shape our daily experience — and even structure a new mode of infrastructural existence?" (Mattern, 2013, para. 6). The following investigation into street name signage works in this realm.

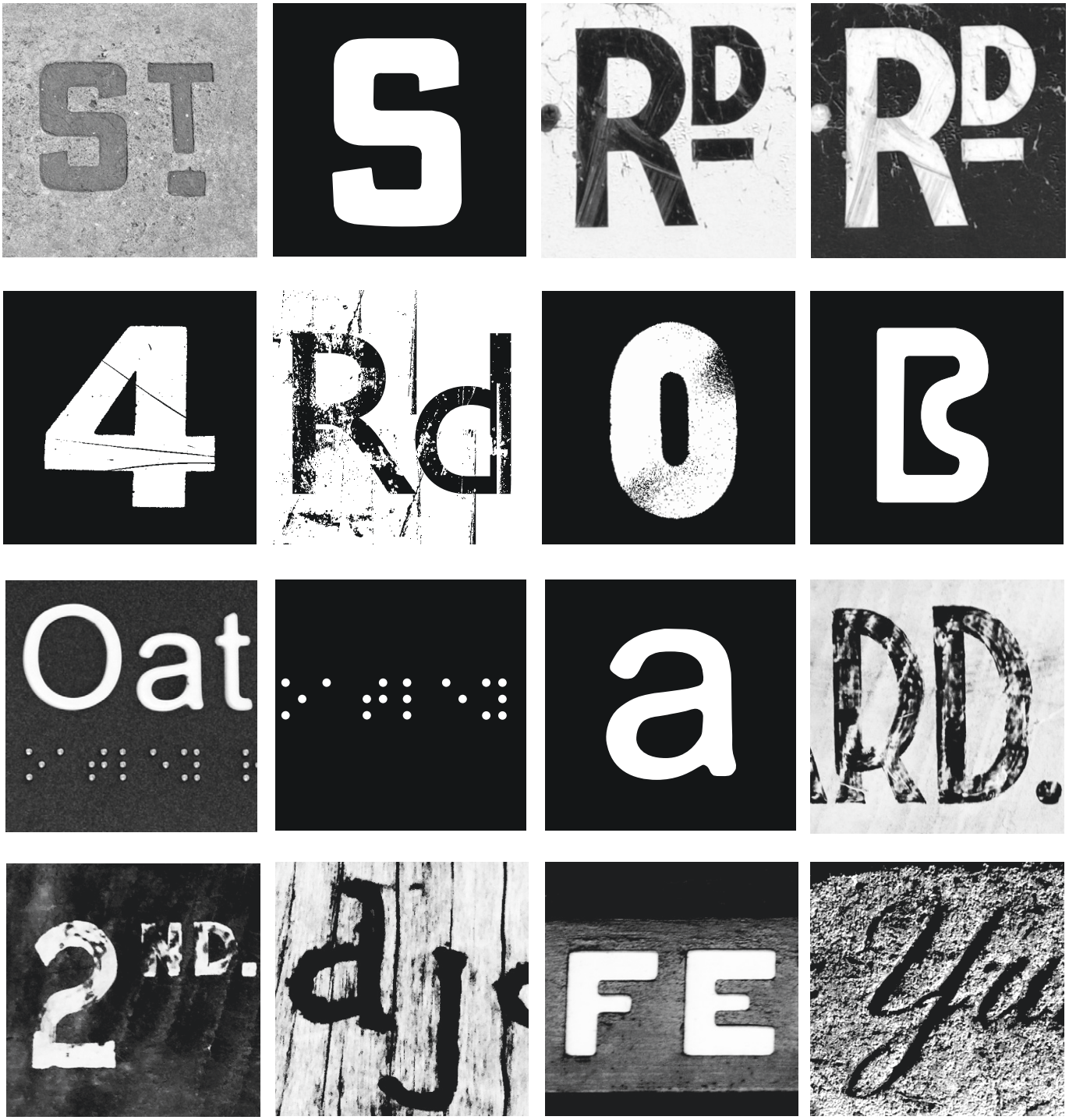


FIGURE 36
Photo-documentation of existing letterform in the inner city of Sydney on which to base letterform design for the development of a typeface.

City of Sydney

LOGO/
STREET NAME/
NUMBERS/

Municipality branding
Addressing/orientation
Pedestrian & traffic

City of Sydney

LOGO/
STREET NAME/
NUMBERS/

Municipality branding
Addressing/orientation
Pedestrian & traffic

Waverley, Sydney

LOGO/
STREET NAME/

Municipality branding
Addressing/orientation
Pedestrian & traffic

Photo and design: Susan Mavor

Wayfinding for District of Tofino, BC, Canada

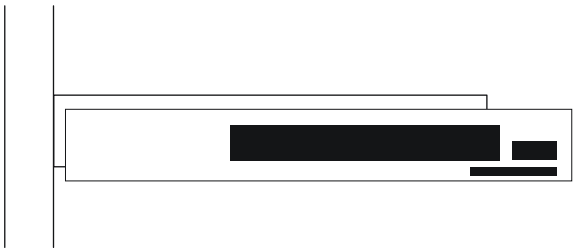
DIRECTING TO ST/
DISTANCE

Wayfinding system

DIRECTING TO ST/
DISTANCE

Wayfinding system

Sydney Olympic Park



STREET NAME/
COUNCIL NAME/

Municipality branding
Addressing/orientation
Pedestrian & traffic

Photo: Sean Monro

Westminister, London

STREET NAME/
POSTAL CODE/
COUNCIL NAME/

Municipality branding
Addressing/orientation
Pedestrian & traffic

▲
FIGURE 37
The hierarchy of information on street name signs.

Contextual survey of Sydney street name signage and potential typeface project

AIM

Noting the prevalence of the street name signage in Sydney from my exploratory photo-documentation studies in black and white, I began the process of my practice-based research by analysing the typographic structure of their letterform. My initial intention was to design a suite of typefaces for Sydney street name signs for the different suburbs[32] of Greater Metropolitan Sydney. This was the only aspect of the research that extended beyond the situated area and was primarily due to the fact that further research into the different street signs in Sydney (see Figure 39) revealed that there was considerable potential for the development of a new street name signage system throughout Sydney. Currently, Sydney street name signs state their municipality with a logo generated by each council and each council uses a different "off-the-shelf"[33] legibility-tested typeface. Original typeface design for each council would contribute to distinctive precincts/villages, with a shift in emphasis to enhancing the identity of the place rather than the branding needs of the council.

Shifting the hierarchical emphasis away from each council's logo, to a suite of different typefaces takes the idea away from ownership of an area or the controlling voice of a governing body to the identity of place. Across Sydney, current street signage is extremely haphazard and there is no coherence or consistency. This project could form a consistent approach that allows for diversity in precincts.

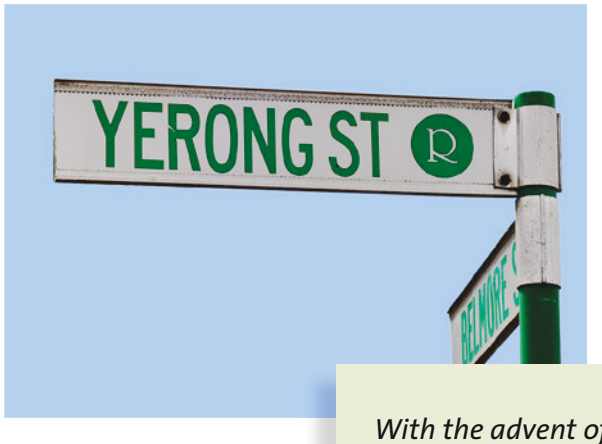
This part of my research intended to ask questions about how these street signs related visually back to digital mapping or wayfinding systems and what the possibilities for involving a digitally activated component (possibly AR) would be.

32 'suburbs' is the word used in Sydney to define precincts/districts/neighbourhoods

33 Refers to typefaces that are bought from typeface foundries as opposed to a typeface designed specifically for the purpose of a project.

FIGURE 38 ▶
Photo documentation.

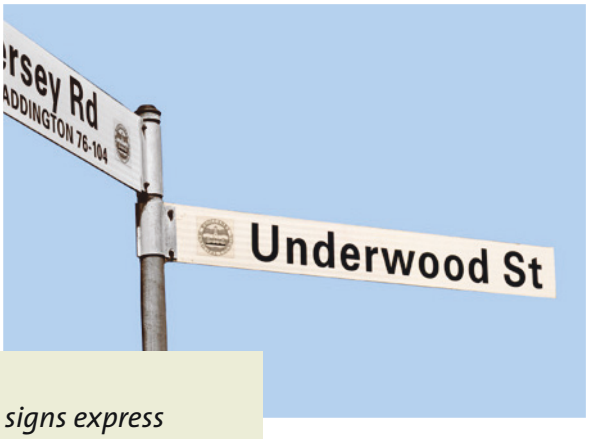
FIGURE 39 ▶
Street name sign insights.
▼



With the advent of mapping technologies and self-driving cars, are street name signs becoming redundant?

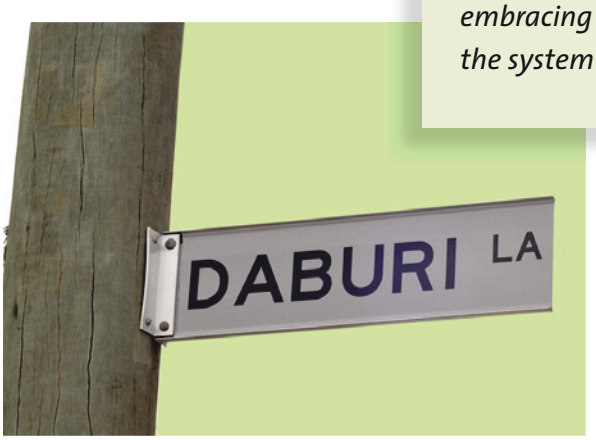
Is the system on which we base this numbering and naming role restricting the way we are wayfinding through other digital means, such as mobile mapping?

FIGURE 39
Street name sign insights.



Street name signs express borders in Sydney in the form of council borders. Are there other borders more critical to citizen needs or views?

Current street signage in Sydney is a colonial construct. How can it allow for dual naming in a respectful and embracing manner? Or should the system change?



INSIGHTS

The process of analysing made me think about the future of many of these street signs and the likelihood or potential of their being replaced by a digital process. It bought up these questions:

- With the advent of mapping technologies and self-driving cars, are street name signs becoming redundant?
- Is the system on which we base this numbering and naming role restricting how we wayfind through other digital means, such as mobile mapping?
- Street name signs express borders in Sydney in the form of council borders. Are there other borders more critical to citizens' needs and views?
- Current street signage in Sydney is a colonial construct. How can it allow for dual naming in a respectful and embracing manner? Or should the system change?

Conclusion

Although an interesting typographic investigation for the future, this project began to feel redundant and redirected my practice-based research to focus on digital as well as physical wayfinding. As mentioned in Chapter 1, precision-based mapping and driverless cars have the potential to make street name signs redundant for traffic navigation (Bogost, 2017; LaFrance, 2016). As the use of AR in precision-based mapping increases, street name signs will become less of a wayfinding necessity from a pedestrian point of view (LaFrance, 2016), while the advent of other forms of addressing, such as what3words, indicates that they could make street name signs a thing of the past. This led me to think of street name signage as digital signage, which I explore in the next chapter.

In regards to developing street name signs as a typeface project, as previously mentioned, Mattern discusses the difficulties in creating typography for place at a national or city level, and how this can create homogeneity rather than encourage diversity (Mattern, 2008). Stephen Banham also comments on this in an Australian context in his thesis. He proposes that perhaps it is best to let typography start to represent place happen culturally over time, and that "The intent to visually represent any culture can lead to brutal abbreviations, compressing the complexity of lived experience of a place into a pattern of crudely-related symbols." (Banham, 2019, p. 49). My initial idea to create typefaces for street signage in Sydney neighbourhoods would need to combine a participatory, community-based focus.

Chapter 5: Preliminary experiments on typographic systems for wayfinding

Learning through doing and making is a continuation on the learning through walking, active observation and photo-documenting of the initial part of this case study (the "what is" investigation on the same area of Sydney). This practice-based research has been a journey of "not-knowing" whether this is a research enquiry primarily about examining typography or research primarily investigating wayfinding. It has moved between an emphasis on typography and an emphasis on wayfinding. It is important to me that these practice-based experiments remain focused on how we can adapt the wayfinding systems in this area to enhance the experience of walking and orientating in this area and that it is primarily about designing systems. This learning through doing and making has taken me on a variety of design investigations, which may look disparate or aesthetically quite different but fundamentally they still have wayfinding and typography at the core of their investigation and aim to operate as a system.
(Journal documentation, 5 February 2021)

▲

FIGURE 40
Site map for digital street name signage.

PRELIMINARY EXPERIMENTS ON TYPOGRAPHIC SYSTEMS FOR WAYFINDING

INTRODUCTION

The "what is in place" contextual survey in this research identified that there were wayfinding systems in the area for "finding your way" based on connectivity, accessibility and legibility. However, the survey found a lack of identity in the typographic approach in the wayfinding systems of this area; it also highlighted the lack of urban wayfinding design that communicated the ecological history of the area and little connection between wayfinding signage and digital wayfinding.

The following suite of experiments was an exploration in creating a typographic system for storytelling. Three lines of enquiry were iteratively worked through: digital street signage for Sydney and air quality signs, all of which led to the development of the prototype *Type Trails*. The practice-based component of this research took place in the CBD area of Sydney from Hyde Park to Circular Quay (Warrang, Warrane, Sydney Cove) unless otherwise noted.

The following chapters present the dialogue in practice from the critical documentation process of this research, the insights I have gained and the methods as they have arisen out of the iterative process of the practice-based research.

As mentioned in Chapter 2 at the end of each experiment, I created a diagram as a visualisation, which allowed me to decipher "the strategies of action, or the model of the phenomena" (Schön, 1995, p. 79), to reflect on the wayfinding principles embedded in each experiment and the main theory embedded in the experiment or to reflect on the process I went through. Figures 46 and 53 are used as a method to help formulate the practice-based inquiry, to make connections between a particular theoretical principle and to connect the practice to the theory.

LOCATING THE STUDY IN DIGITAL STREET NAME SIGNAGE

The initial reason for choosing this area in the heart of Sydney's financial centre for the research was to follow some of Sydney (and Australia's) earliest principal streets. We are following the traces of Aboriginal past activity over thousands of years on some of Sydney's main streets, George Street being one of them (Troy & Foster, as cited in Daniel, 2018; Kombumerri, 2019; Foster, as cited in Kombumerri & Hromek, 2021) and this first experiment looked at ways of communicating the thousands of years as a pathway of trade. In addition, many of these inner-city streets, particularly the small ones, have changed their name many times and there are interesting stories that can be told through this (Fitzgerald & Murray, 2009).

George Street is Australia's oldest colonial street[34] and was a bustling, thriving hub of commerce, retail and residence. At one point it was the town's main shopping street, which is why, in the tradition of English streets, it was originally named "High Street".[35] Pitt Street, like George Street, runs up from where the head of the Tank Stream used to exist. One of its parallels, Macquarie Street, situated on the highest ridge, contains many of Sydney's oldest architectural and heritage sites, such as the Hyde Park Barracks, the Law Courts and Sydney's oldest hospital. Historically, Macquarie Street was a street of wealth, in sharp comparison to Pitt or George streets (*Dictionary of Sydney*, n.d.; Karskens, 2009). Bridge Street is named after the small wooden footbridge that was built across the Tank Stream (*Dictionary of Sydney*, n.d.; Karskens, 2009).

34 This is mentioned in the City of Sydney's History of Sydney Streets spreadsheet, which is an updated document that contains original naming and the history of the naming of each street: History-of-Sydney-Streets2.xls, www.cityofsydney.nsw.gov.au/learn/sydneyshistory/people-and-places/streets

35 This original name is mentioned in the City of Sydney's History of Sydney Streets spreadsheet: History-of-Sydney-Streets2.xls, www.cityofsydney.nsw.gov.au/learn/sydneyshistory/people-and-places/streets

Experiment 1:
Digital street name signage

AIM

Analysis of street name signage led me to think about the way the structure of our street signs in Sydney determines the way we view our neighbourhoods. Currently, Sydney street name signs advertise the identity of their district (generally termed "suburb" in Sydney) through a logo and are generated by each separate municipality (generally termed "council" in Sydney). Each Sydney council pays for the design, creation and maintenance of its street signs and each council uses a different off-the-shelf, legibility-tested typeface [36]. The current street signage is thus extremely haphazard; there is no consistency across the city. In addition, while Sydney street name signs currently indicate the borders of each separate council or municipality, Sydney's borders change for schools, postal codes, political election boundaries and Country. My experiment aimed to examine typeface design as a consideration for identity and as a system for wayfinding; to explore how this might work as digital street signage and how it could communicate the history of Sydney streets and other borders.

36 Refers to typefaces that are bought from type foundries as opposed to a typeface designed specifically for a project.

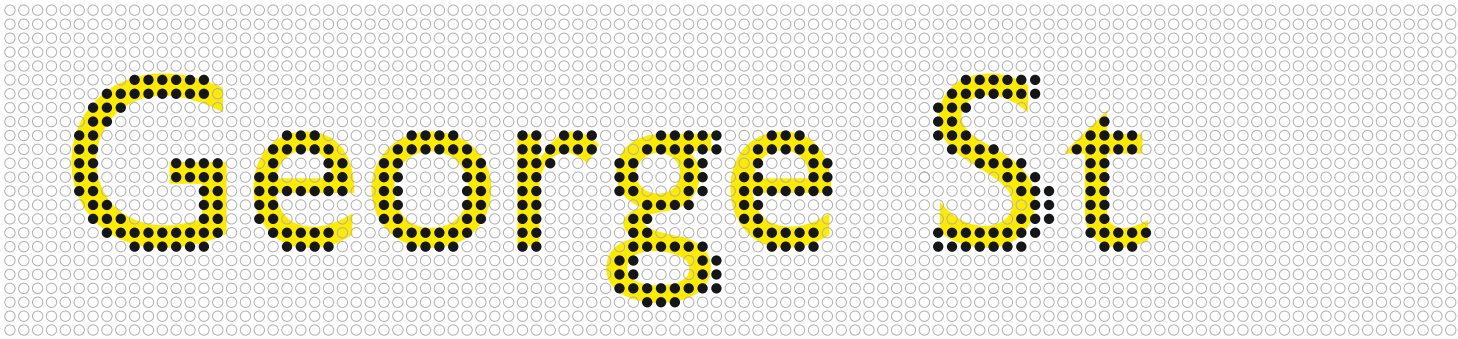
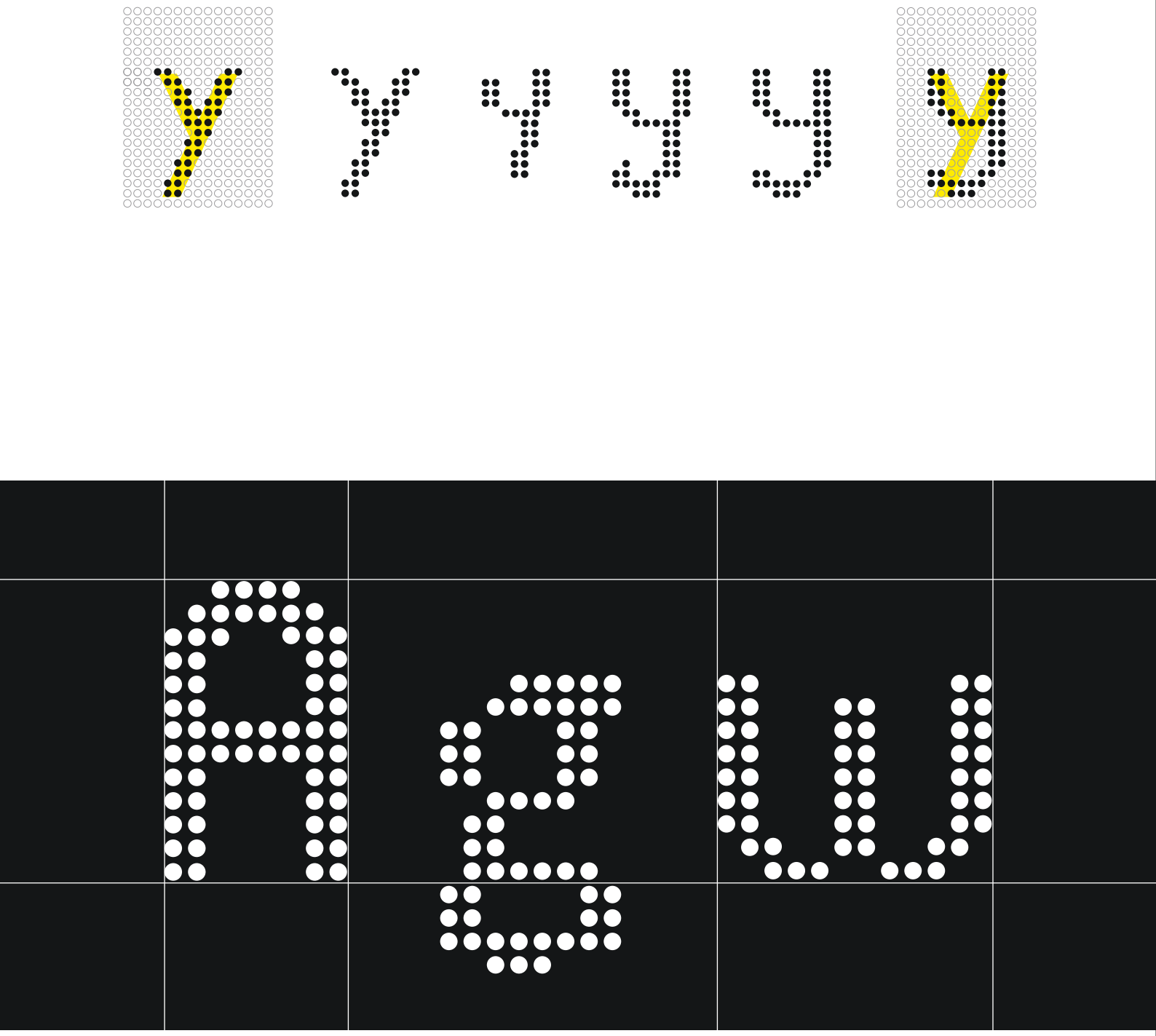


FIGURE 41
Reworking Gill Sans for a digital LED screen.

This is also an argument for bringing storytelling into wayfinding, addressing and navigation through digital signage. First, street name signs are also a form of storytelling. Second, more information can now be delivered digitally than in static systems and this change in content can make us revisit the colonial, cartographic-based construct of these wayfinding and addressing mechanisms.

PROCESS:

The typeface I started to develop links to the existing Gill Sans typeface used in the current static City of Sydney street name signage. I chose to maintain the same typeface for continuity but to expand it to fit a digital system. Small amendments were made to certain letterforms for better legibility or to fit the grid, which is 13 dots high. For a final system, the grid would need to be identified first and the letterforms then designed to fit the grid. A 2-dot width was chosen so the typeface can be altered to be more distinctive than a 1-dot grid and to look like a medium weight font, which is ideal for signage.



▲

FIGURE 42

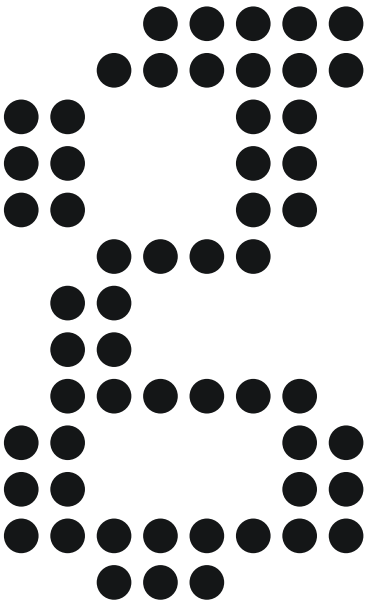
Developing distinctive letterforms and determining widths.

The work referenced type designers Lucas De Groot, Jean Francois Porchez and Rene Knipp, all of whom have designed dot-based fonts for LED displays. This design takes its own journey, beginning with the Gill Sans typeface and developing each letterform so that it is legible and fits with the other letterforms in the same typeface.

Type could fade in and out and dissipate rather than moving across the screen. Words would then flicker in and out making the type dynamic. This made me think about how the affordances and limitations of designing for the digital mechanism also influence the typographic possibilities and can help to add meaning. Shifting this into a time-based mechanism means that the style of transitions between the content can convey a concept; the dissipation of the type can convey a sense of moving through time.

The idea that street signs could be digital was influenced by the 2013 prototype created by Breakfast NY LLC. This company created an interactive sign that kinetically points in direction and is connected to social media to deliver information on public transport, the location of local amenities, food outlets and even news items (Stinson, 2013). It is designed to be information-based rather than interpretive (Stinson, 2013), a smart city prototype that incorporates the idea of orientation but operates more as an alternative to an information touch screen booth or panel.

My digital street name signage also references the work of artist Naho Matsudo, who creates art-based projects questioning the data that is generated by cities. Her artwork *every thing every time* turns city data into "impractical poetry", so that the information is no longer functional (Future Everything, 2017, para. 8). Neither typeface development nor the role of typography is a focus in Matsudo's work. In my digital street name signage, the idea is not to feed from city-based data but to use historically curated material that is publicly available. It aims to be functional and fulfil a wayfinding role.



To create a typeface with identity, there must be characters that have distinctive forms or shapes, that is, that differentiate them from other typefaces. I worked on a variety of characters to do this, such as the letterform "g".

FIGURE 43 ▶
A distinctive letterform.

FIGURE 44
Studies in dissipating text.

INSIGHT

The typeface I started to develop for the digital street name signage is not a dot font because it is trying to look like dot painting, it is a dot font for an LED system. The typeface development would also need to go through a period of looking at the way the light haloes through the LED screen, to get the letterforms successfully legible and distinctive. Particular attention is needed in relation to the counters of the letterforms (the spaces contained in letterforms), since sufficient space in the counters of the letterforms enhances legibility. This factor was identified by Gerard Unger when developing a typeface for LED signage in 1974 for the Amsterdam Metro (Unger, n.d.). The digital typeface I developed is based on the current Gill typeface to tie it to the local identity of Sydney's street name signs but this is problematic because Gill Sans is identifiable with the city of London where, as mentioned in Chapter 3, it is prevalent in architectural naming and commercial shop front signage (Ovenden, 2016; Banham, 2019).

> A stroll along any British high street will reveal something rather curious about the lettering on view: almost all of it stems directly from, or shares some common ancestry with, the typefaces created by Edward Johnson (1872–1944) and Eric Gill (1882–1940). Indeed, their influence can be discerned throughout British life. Switch on the television or computer, open a newspaper, watch a film, read a map, fill in a form, go to a shop, take a train, drive along any road – almost everywhere you look, the lettering style they introduced will be there in front of you. (Overden, as cited by Banham, 2019, p. 49).

Therefore, the typeface that I started to develop for the digital name signage remains tied to its colonial past and I decided that a completely original typeface would be beneficial.

This experiment forced me to analyse the ownership of the street signs, what information was likely to be communicated through a street sign and what could be potentially communicated in addition to the addressing and directional functions. Most street name signs on street poles point us in the direction of where we need to go. I continued this format rather than looking at street signs that are attached to walls.

Digital signage presents an opportunity to flick between original naming of the area and current naming. It is also a form of mapping because it can determine borders. Digital signage can give more information than static signage; it can tell the story of significant streets, or to tell the stories of street name signage. The names of the smaller streets in Sydney have changed many times and public historians Shirley Fitzgerald and Lisa Murray say that street names can tell us about the lives of people living on these streets (2009), which could also play into the storytelling. Digital signage also operates as a gateway and gateways are an integral part of large wayfinding schemes, defining the identity of a neighbourhood or section of a city (Berger, 2013).

▲
FIGURE 45
A mock-up of what a physical prototype would look like in situ.

FURTHER REFLECTION TO MOVE FORWARD:

Through this process of reinterpreting street signs as digital signage, I find that signage can be used to communicate the street's beginnings. The role of the street name sign changes from one of primarily addressing and locating to one of communicating other borders, the reason these streets are where they are.
My learning from this was how an existing format of wayfinding could be re-interpreted to fulfil another function using new digital technologies. The digital street name sign can operate as a gateway sign, can communicate additional or historical naming and aspects of its history and it can be used for storytelling.

The insight that extended from this experiment was how dynamically playing with the content in this wayfinding mechanism provided a system for a new form of signage. Having said that, I found the wayfinding mechanism of street signage too restrictive to expand much further. There is not a lot of information that can be communicated through the size of the street sign to deliver narratives and changing the role of the street name sign could potentially be confusing to the user.

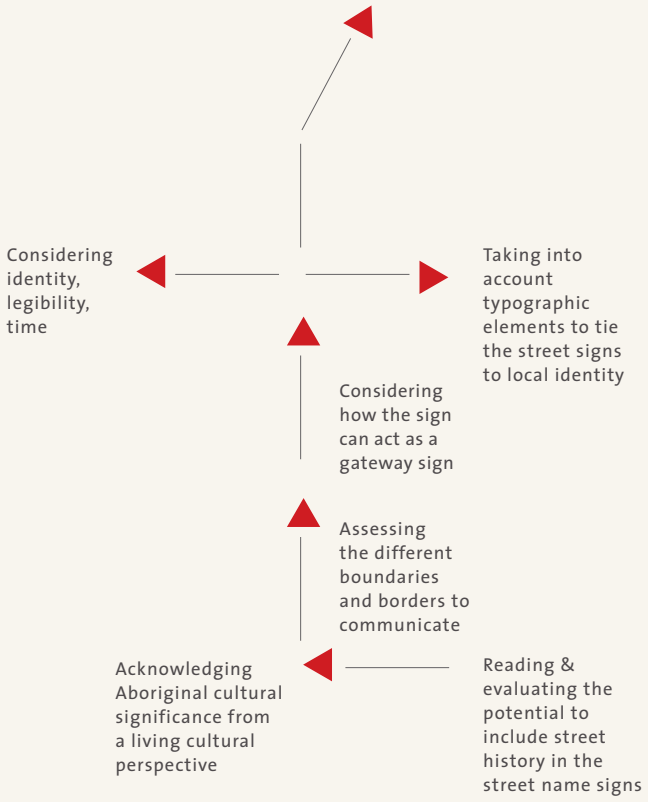


FIGURE 46
Breaking down the steps of the process in this experiment into a diagram.

This experiment also provided insights on the basis of which I could extend into other experiments, for example, into how the affordances and limitations of designing for digital signage could influence the typographic possibilities and could add meaning. Shifting from static signage into a time-based digital mechanism meant that the style of transition between one element of the content and another element allowed me to convey a concept. The type dissipating in the street signs appears to convey a sense of moving through time.

In this digital street name signage experiment, I used typeface design as a typographic system for storytelling within wayfinding design. In the following experiments I explored other typographic devices and ways to use typography as a system for storytelling in wayfinding. The next step was to look at the potential for a separate wayfinding system that also played with the relationship between the digital and the physical but was not tied to the restrictions of an addressing system.

FIGURE 48
Site map for air quality signs.

Photo: Huw Jones

FIGURE 47
George Street, Sydney, covered in smoke due to the 2020 bush fires. December 2020.

Experiment 2: Indicators of air quality as digital signage

SITUATING THIS EXPERIMENT

Situated in the same area as the previous experiment with one sign in Martin Place and one on George Street, this experiment expanded out from George Street to position one sign in the Royal Botanical Gardens and one at Circular Quay.

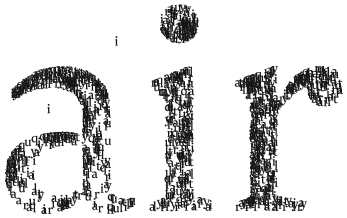
AIM

At the same time as I was examining street name signage, I was working on a second line of enquiry into what the environment could communicate through sensor technology embedded in digital signage. I was looking specifically for opportunities to communicate air quality, which is critical to Sydney in relation to bushfires and how this is a wayfinding concern. My aim was to communicate to the public air quality data visually alongside a community-based social-media commentary.

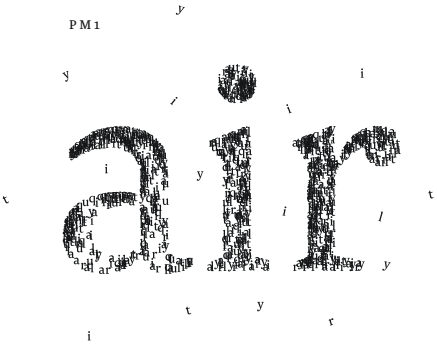
Borrowing from Mattern, and playing with the idea of making visible the systems that are often invisible to us in order to reveal their processes (Mattern, 2013), I used this experiment to develop an alternative to air quality apps that are experienced through location-based (hand-held) devices. In my alternative, the information was designed to be communicated through physical digital signage in the city. Initially the idea was that the data could be received through sensors attached to the digital signage, but after the devastating Australian bushfire season of 2019/2020, I realised such data needed the most reliable source available and would be better sourced through the NSW government's air quality concentration data from monitored sites in Sydney (through a "network of air quality sensors and instruments"[37]). The air quality concentration data measures a number of pollutants and provides colour-coded air quality categories ranging from good to extremely poor, just like the air quality apps.

37 The air quality concentration data for Sydney, is updated hourly and forecast daily at 4pm. https://www.dpie.nsw.gov.au/air-quality/air-quality-concentration-data-updated-hourly/daily-air-quality-data

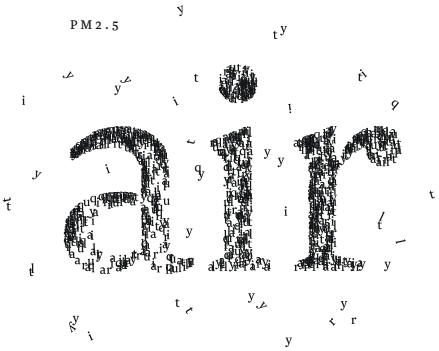
risky dust particles in the air



PM1

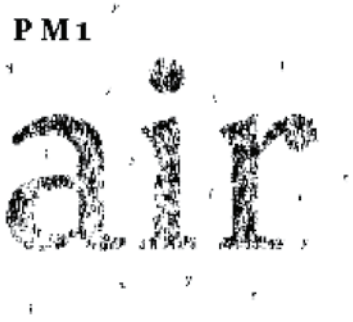


PM2.5

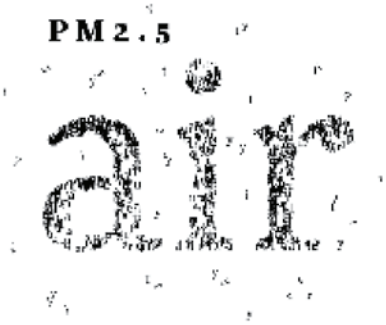


Type form breaks up into small particles of type as the air quality worsens.

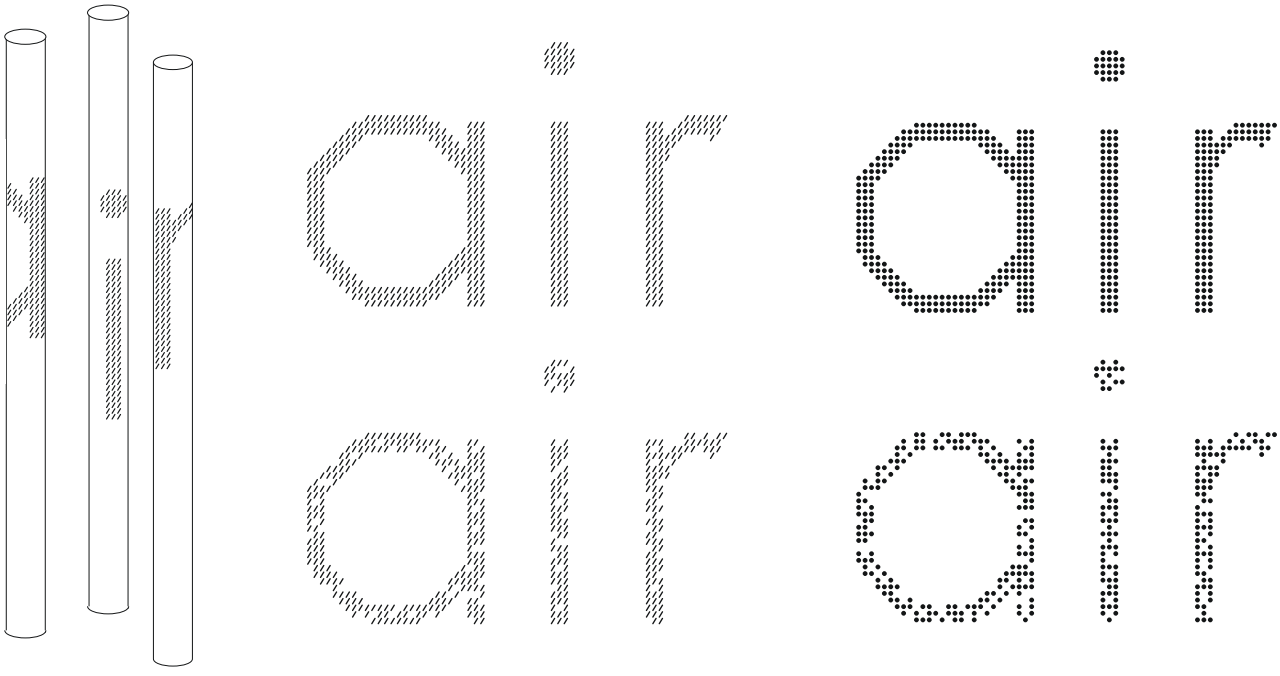
PM1



PM2.5



Typographic approach would communicate on a low res screen



▲
FIGURE 49
Design concepts
for air quality signs.

Currently there are apps like Air Matters and Air Visual that can give a detailed analysis of air quality, accompanied by a map and push notifications which the user can set to their requirements. These are great tools for the individual but they focus on the individual and not on the issue as a community problem.

What re-imagining these apps as digital physical signage does is turn the receiving of the information as a personal, individual experience back into the public domain. The idea is also to combine the air data with other social media sources that provide a running public commentary that contains public questions about the health of the air quality, or public anxieties and conversations about the air quality. This could be sourced from organisations such as #NSWHealth and fed back into the same screen. An algorithm could search for specific sources of dialogue, for example, "Sydney+air+quotes", which could be quite specific, i.e., limited to #NSWHealth and other specific sources. Placing visualisations of air pollution data on digital screens in the public domain rather than on a personalised system makes it very obviously a public or collective rather than an individual experience.

Artist, scholar and engineer Natalie Jeremijenko works in this space. She balances the disciplines of science, art and technology to interrogate the environment and its health but does not use typography as a tool for communication in her practice-based projects. Her work *Amphibious Architecture* (installed in the Bronx and East Rivers NY in 2009[38] and in the Derwent River, Hobart, Tasmania in 2017) visualises and lets the river talk to the user through a series of floating lights that flicker and change colour with interaction. Users can send a text message to the artwork and information based on data about the fish life and water quality, picked up through sensors, is then sent as a text message back to the user, triggering the lights to flicker and change colour. The artwork uses real-time data picked up through water quality sensors on the dissolved oxygen levels of the water and the movement of fish life (Black, n.d.; Malpas, 2017; Woebken, 2009).

38 The original artwork in the Bronx and East Rivers in New York, (2009) was a collaboration between Natalie Jeremijenko and the project team: Chris Woebken, David Benjamin, Amelia Black, Abha Katrina, Jonathan Laventhol, Deborah Richards, Zenon Tech-Czarny, Kevin Wei, Soo-In Yang.

39 https://futureeverything.org/portfolio/entry/naho-matsuda-every-thing-every-time-cityverve/

The work also references Naho Matsuda's *every thing every time* (previously mentioned in this chapter under Digital Street Name Signage) as a public artwork for the FutureEverything event in Manchester (July 2017)[39]. Matsuda's project questions the data that is generated by smart cities by turning it into poetry, "impractical poetry" (Future Everything, 2017, para. 8). In Matsuda's words:

> every thing every time is a piece of real-time digital writing, which is drawing from the many "things" and "events" and changes of "status" that are constantly happening in Manchester. In every thing every time I have turned these data streams into narratives formatted as poems, that are stripped from their location information and any data transmitting purpose. Smart information becomes impractical poetry. (Future Everything, 2017, para. 8)

She asks:

> Can we see the urban landscape differently through the technologies that make sense of it?' (n.d., para. 2) And what does data become without its informational value? And what happens to all the data that is collected from our smart cities? (n.d., para. 1)

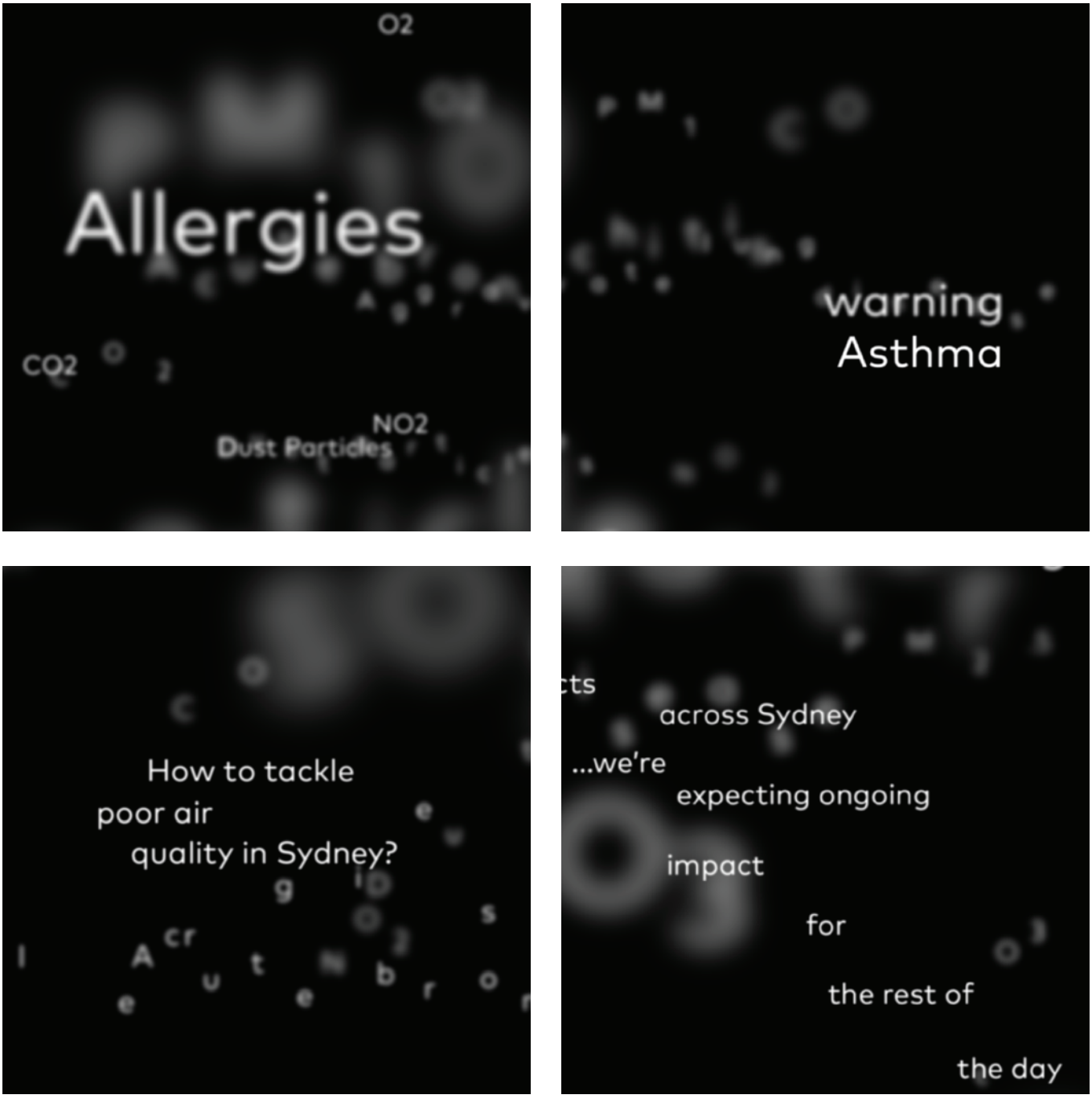


FIGURE 50
Thinking through the possibility of smaller LED screens in public places.

Both of these artists used art installations to enquire what sensor data was producing from the environment and created dialogue around this through their work.

An article in *Wired* magazine by Nicole Kobie appeared on the relationship between air pollution and wayfinding. Kobie stated that researchers at London's Turing Institute in the UK were gathering data and creating walking route algorithms to create an app that could give information on what walking routes had less pollution. This aimed to help walkers detect their options on given routes so they could make informed choices about whether to walk that way to work.

> Researchers are investigating how to model air quality to help pedestrians and runners avoid pollution, while others find ways to assess the beauty of a street or how happy it makes us. But two major hurdles remain: gathering the data and algorithms to churn through it all. Neither are easy tasks. (Kobie, 2019, para. 3)

A paper published by MIT researchers led by Siqi Zheng used real-time social media data to investigate whether air pollution (2.5 ultra-fine particle matter, which affect the lungs and the heart) had an effect on urban happiness (Zheng et al., 2019).

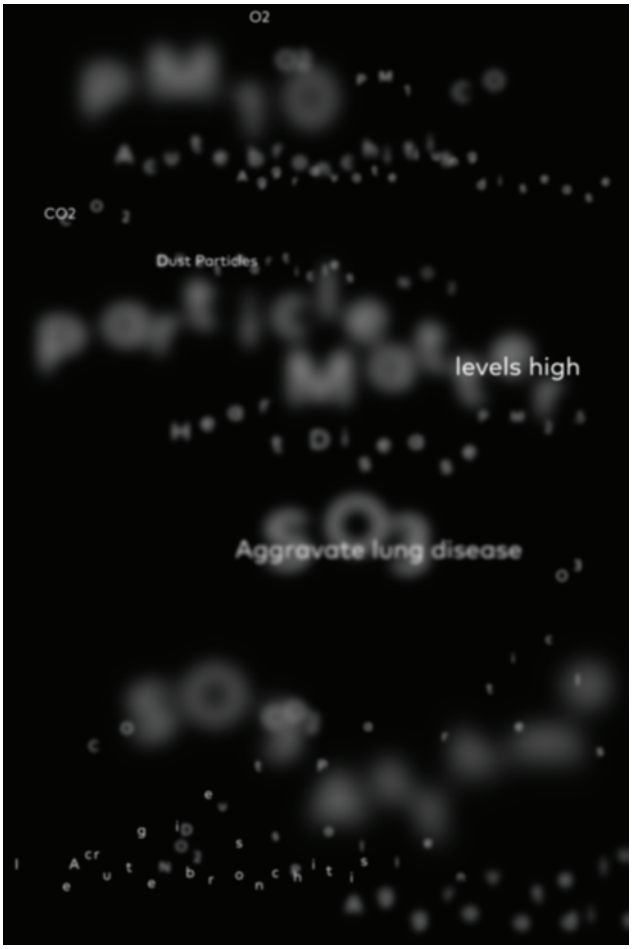
My indicators of air quality as a digital signage experiment aimed to investigate how a typographic system in digital wayfinding could simultaneously deliver information on air quality and act as an enquiry about what type of information we are gathering from the environment through data related to wayfinding. My experiment also aimed to express community views through simultaneously presenting publicly available information, including a running commentary with questions from the public about air quality and their anxieties and conversations.

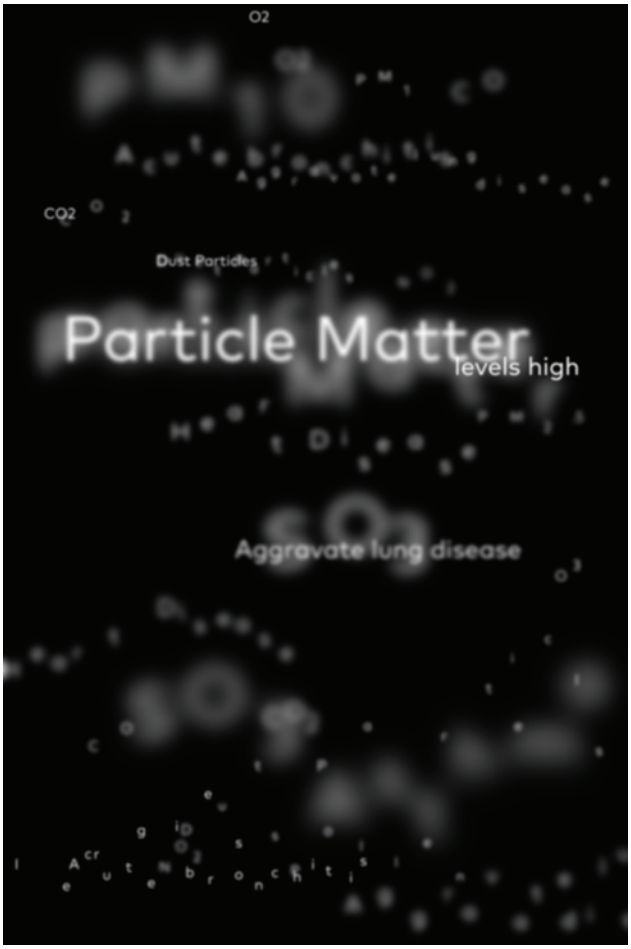
This experiment focused more on typography as a system for communication in a city than on wayfinding. However, it also focused on air quality as an environmental aspect of the area, because it is a walkability issue and therefore a considerable factor in wayfinding.

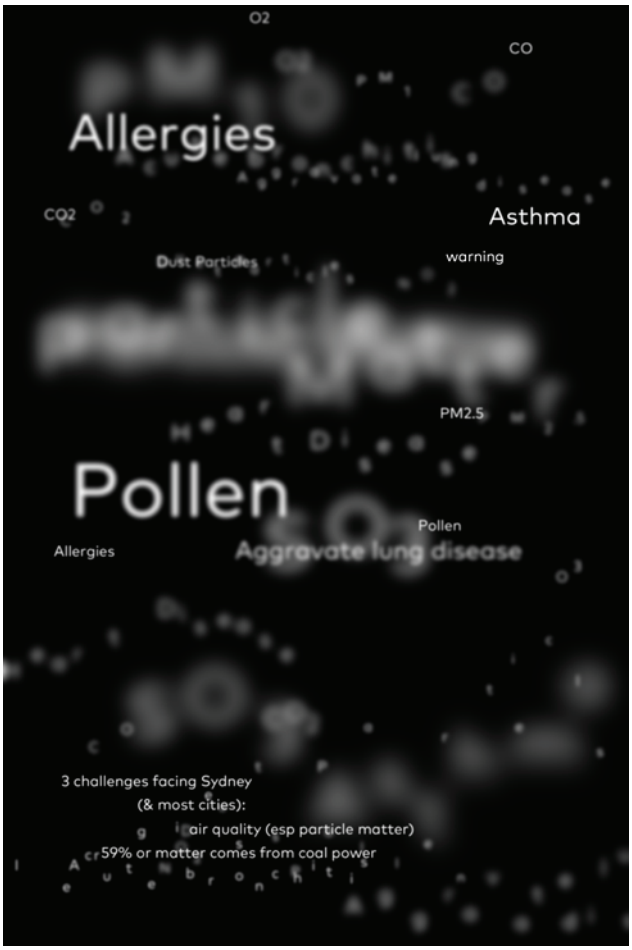
In conducting the experiment, I was interested in how information could communicate to the city as a community, not the individual. Acting as a prompt for dialogue and communicating information, the experiment's aim was to specifically interpret sensor data related to air quality through a typographic experiment in city signage in the City of Sydney.

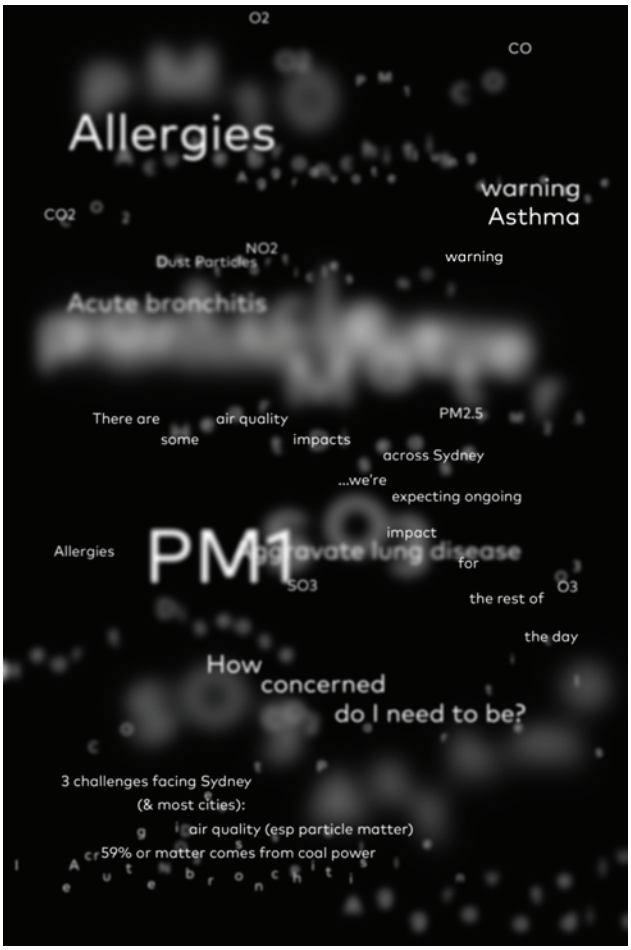
PROCESS

My initial ideas were developed to work as a digital output on clip-on screens that could be attached to existing urban outdoor power supplies such as lighting. Words on the screens would grow out of smaller letterforms and the letterforms would grow or disperse like particles of air and particles of speech as the air quality worsened or improved (see Figure 49).


O2
CO2
Dust Particles
levels high
Aggravate lung disease


O2
CO2
Dust Particles
Particle Matter
levels high
Aggravate lung disease


O2
CO
Allergies
CO2
Asthma
Dust Particles
warning
PM2.5
Pollen
Pollen
Allergies
Aggravate lung disease
3 challenges facing Sydney
(& most cities):
air quality (esp particle matter)
59% or matter comes from coal power


O2
CO
Allergies
warning
Asthma
CO2
NO2
Dust Particles
warning
Acute bronchitis
There are
air quality
some
impacts
PM2.5
across Sydney
...we're
expecting ongoing
impact
Allergies
PM1
for
SO3
O3
the rest of
the day
How
concerned
do I need to be?
3 challenges facing Sydney
(& most cities):
air quality (esp particle matter)
59% or matter comes from coal power

In this iteration (see Figure 49), words grew out of lines or dots with the potential to be displayed on LED poles, or LED lights through poles. The typographic intention was for the words to dissipate depending on air quality levels and the type itself would be dynamic. Both of these failed to communicate another layer of information and restricted the pace of information through "growing" too slowly.

In the next iteration (see Figure 51), typography was used as an experiment in motion, blur and scale; replicating the quality of air through the blur of the type, the words would respond to the sensor levels. If the air quality levels were bad, the numerical levels and the health conditions associated with that would come to the forefront, increase in size and become clear and focused (without blur). The blur and scale create a sense of dimension, the words that are not related to the data shrink in scale and zoom out to look like smoke in the air. This concept is proposed to work as a digital output on existing outdoor screens, i.e., advertising screens, in other words, in public areas where the public expect to find information.

Unlike the digital street signs (experiment 1), this exploration did not involve a typeface design. Rather, a sans serif typeface was selected for its rounded forms and legibility. The letterforms become distinctively original through their placement and blur, rather than being a typeface designed for this purpose. Type becomes legible if pollutants are picked up by the sensor in the air and grows in size and legibility when detected at increased amounts, i.e., when particle levels are too small or pollen levels are too high. The words are intended to mimic air pollution, particles of speech to reflect the particles in the air. The type itself plays a role in looking like particles and particles of speech – dynamically it grows in size.

INSIGHT

The method of dissolving and dissipating text through zoom and blur, or through enlarging and blur is one I would like to keep advancing. The play with words and the rhythm the words moved in accentuated the visual poetry in this experiment. For all its visual poetry, however, the content did not fit with the communication of safety, regulation and authority needed at a time of emergency or crisis and so it was explored no further.

FURTHER REFLECTION TO MOVE FORWARD

I intend to keep the ways in which the type functions for further projects but to bring my research back to a wayfinding project. This is because the project experiments with community dialogue around air quality and with reading the environment but it does not fit as a wayfinding project. The environmental aspect would be good to extend into another experiment.

The learning, therefore, is that content can be delivered in a visually poetic manner and to make elements that are not seen but that do exist as part of the way our streets operate visibly. However, this would be better done with other forms of storytelling content that do not need the visual language of emergency and safety.

◀ FIGURE 51
Design concepts for air quality signs.

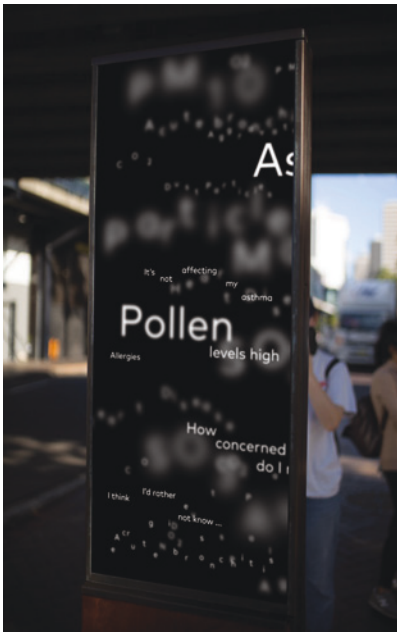


FIGURE 52
A mock-up of what a physical sign would look like in situ.

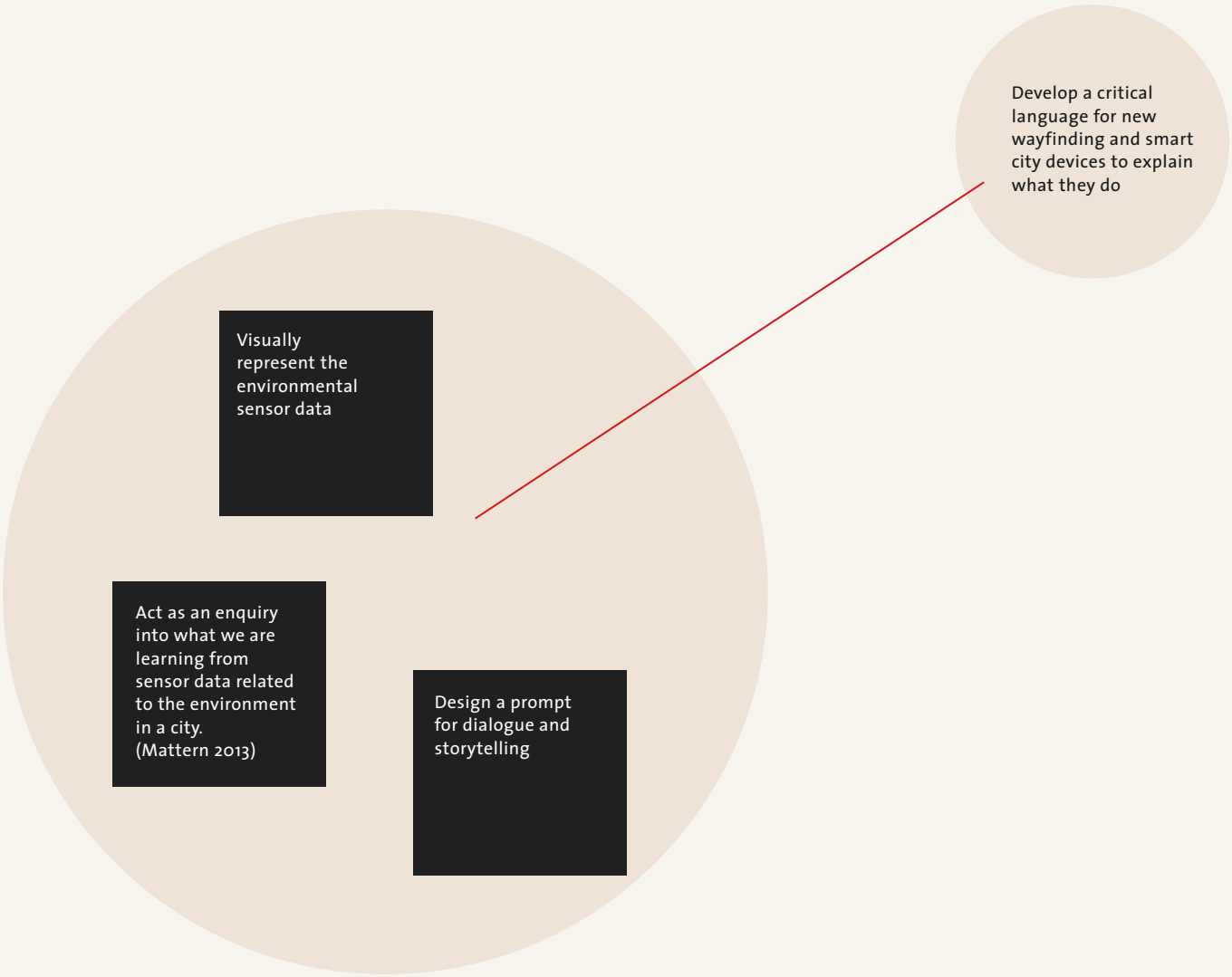
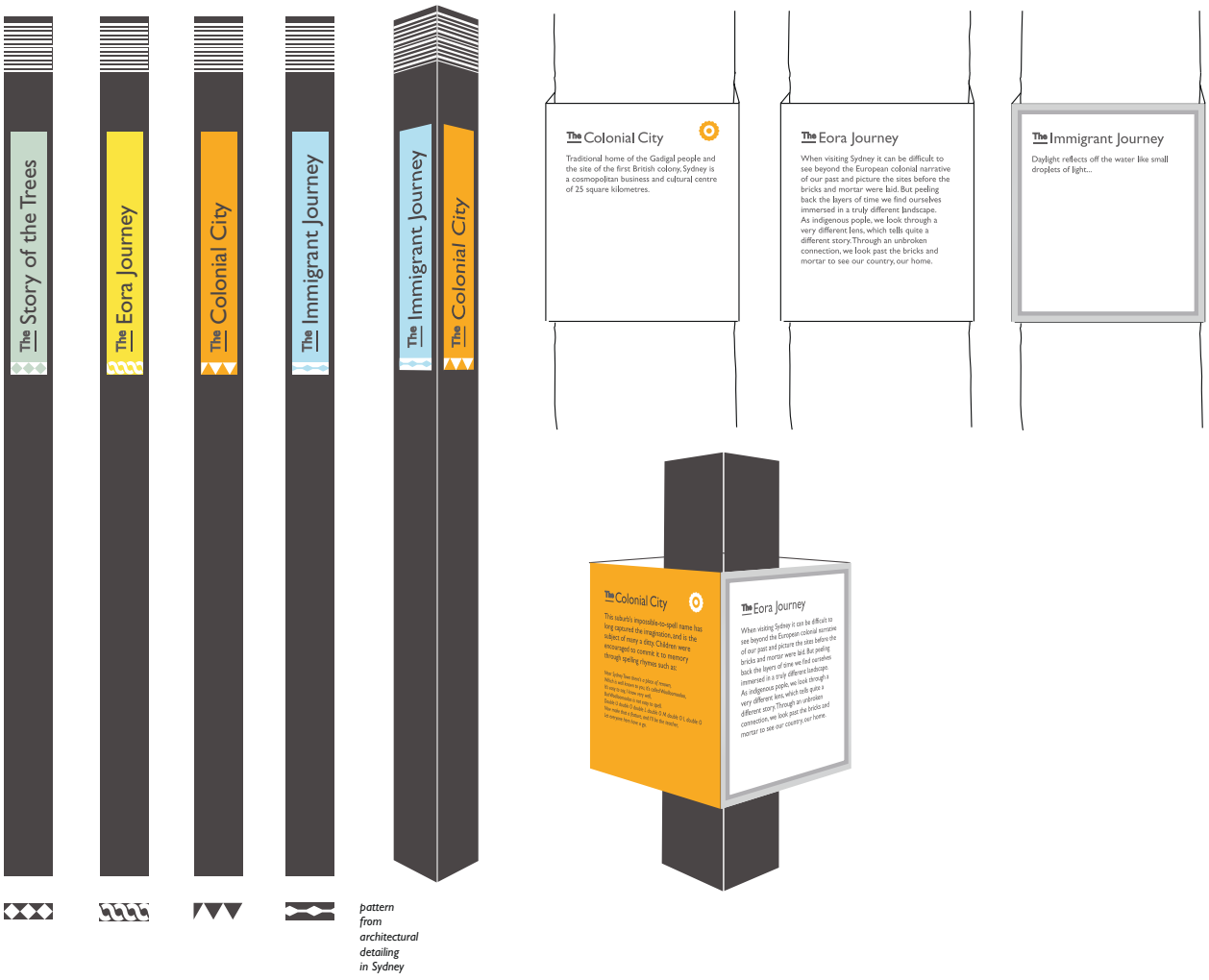
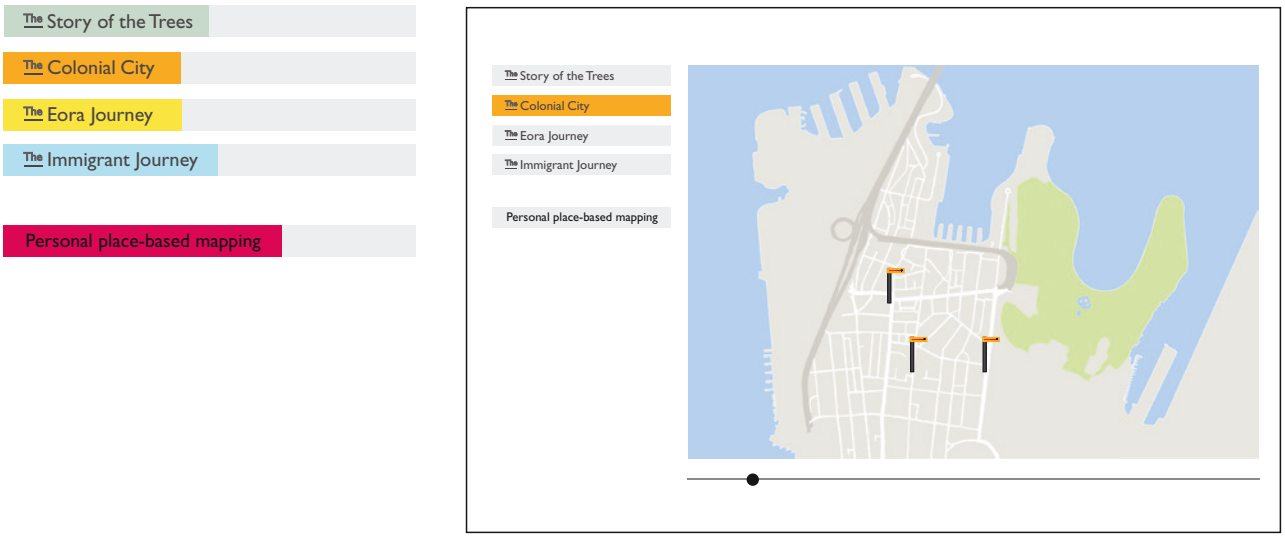


FIGURE 53
Reflection on my indicators of air quality as a digital signage experiment.

It felt necessary at the end of each experiment to reflect on the steps taken in a diagram format, to establish what new learning this might bring to alternative approaches to wayfinding design for a city.





▲

FIGURE 54
Design of a branded signage system for story poles, with categories for storytelling.

FIGURE 55
Alternative design for a signage system.

Experiment 3: Story poles

AIM

For a period of the research, I entertained the idea of putting together guidelines and design for an updatable wayfinding system for the City of Sydney based around storytelling. Similar to the way geo-located walking apps work, or curated stories for city walks, the wayfinding experience would revolve around storytelling. City narratives would be categorised into journeys, following place-based stories of the past and present. The main difference from walking apps or city wayfinding that already operates in this manner, for example, the Como wayfinding signage in Italy, is that the aim was to have this as an updatable wayfinding system, so the curation of the stories could change depending on the curator.

PROCESS

E-paper technology provides an alternative to LED screens in the outdoor environment. The signs are powered through solar energy panels integrated into the signage panels. There are bus signs around the Queen Victoria Building that use this technology. This could be utilised in this context too, so the content could be updatable.

INSIGHT

Updatability, or how the wayfinding system links to data, became an important factor here, as did "whose stories" and "what stories" and who should curate the information that would be communicated. The curation would need to involve the participation of the local government as well as city cultural centres and museums. Placing signs on poles at specific locations meant integrating updatable story pathways became restricted to these locations. The way this was to be curated became the emphasis of this idea, rather than the storytelling leading the journey. As a result, I moved away from it as it did not align with my research questions. It also brought up problems of keeping it maintained and updated and that it might create "grand narratives" that would not reflect a wide range of voices (Farman, 2015, p. 110). The themes themselves could become "grand narratives" with the potential to become contentious. Story poles also became a branded signage enquiry as opposed to a typographic system.

FURTHER REFLECTION TO MOVE FORWARD:

This enquiry was also an obvious interpretive wayfinding response–curating digestible amounts of storytelling positioned on signs that sit on poles. It also remained fairly directive and risked speaking more to 'the strider'[40], the traveller who wants to be directed, rather than 'the stroller'[40], who wants to get lost and accrue new narratives and information along the journey.

40 Per Mollerup argues that there are two types of travellers, those who like to be directed and those who like to find their way around a city. Similar to this, during the Legible London project, two distinct personae were created that were coined as the "strider" and the "stroller". See page 41.

Conclusion

Through this suite of experiments, I reimagined what could be in this space of digital wayfinding as digital signage and how typography could work within this as a system of storytelling. As mentioned earlier, an important aspect of my critical documentation has been to demonstrate how the particular methods and processes evolved through an iterative practice–each experiment led to a new idea, experiment or process–and how this led to insights that led to the final prototype and allowed me to show how precedents or scholarly articles informed my thinking or making.

From these enquiries, I moved to develop a typographic digital map as a prototype that could work across many platforms to feed the storytelling from an enquiry into the invisible stories of the ecology of the area and to look at how this could have multiple layers in a non-linear format and be delivered in a visually poetic manner.

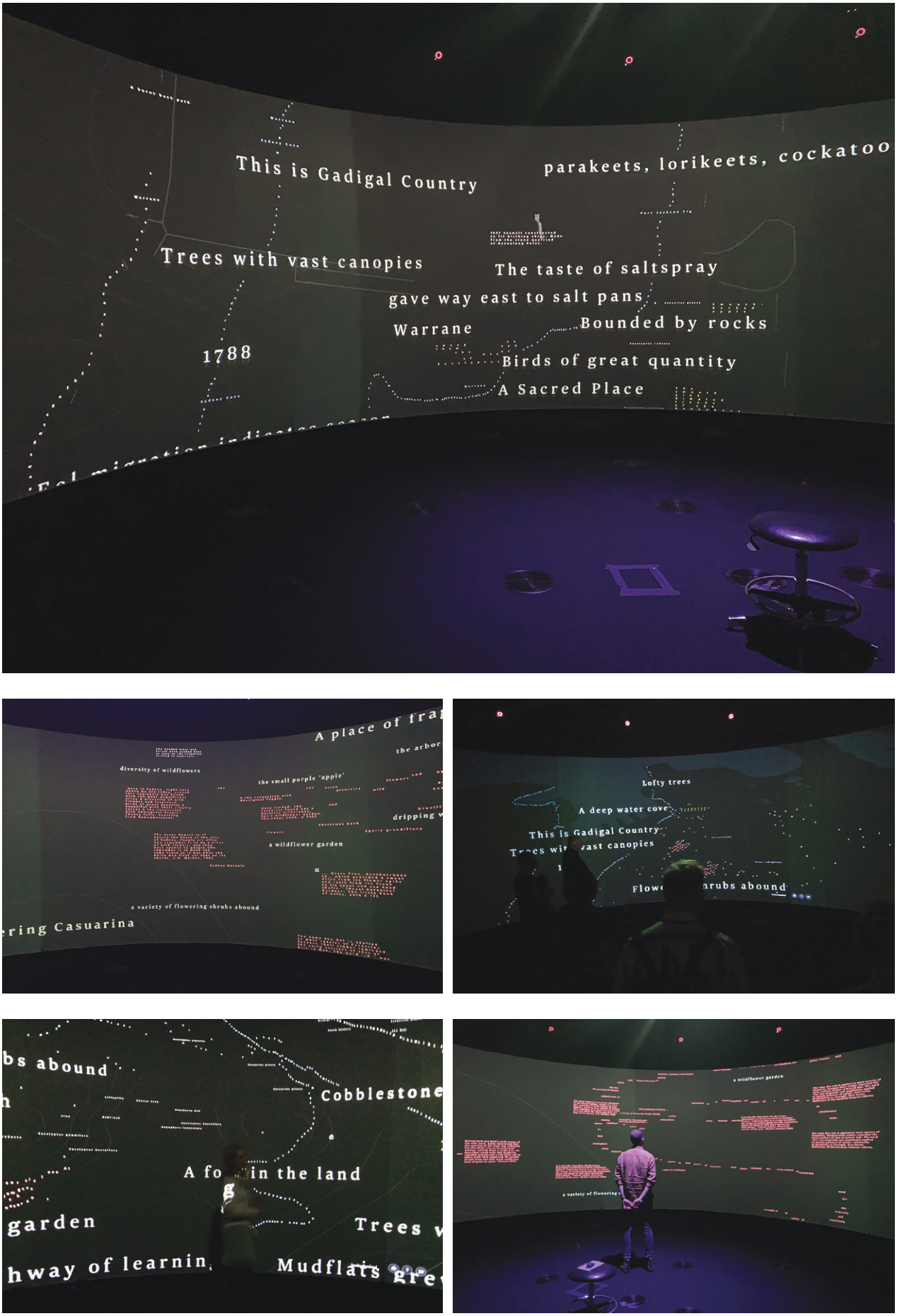
CHAPTER 6

Type Trails

Tools of my own discipline become practice-based methods and how I form insights through the process of critical documentation.

▲ FIGURE 56
Prototype application in use (a mockup)

Photos: Nicky Hardcastle and Ben Simons



▲ FIGURE 57
Prototype exhibited in a small exhibition in the Data Arena at the University of Technology


WARRANE/CIRCULAR QUAY
THE ROYAL BOTANICAL GARDENS
LOFTUS ST
YOUNG ST
PHILLIP ST
BRIDGE ST
GEORGE ST
PITT ST
MACQUARIE ST
ELIZABETH ST
MARTIN PLACE
KING STREET
JAMES ST
ELIZABETH ST
HYDE PARK

TYPE TRAILS

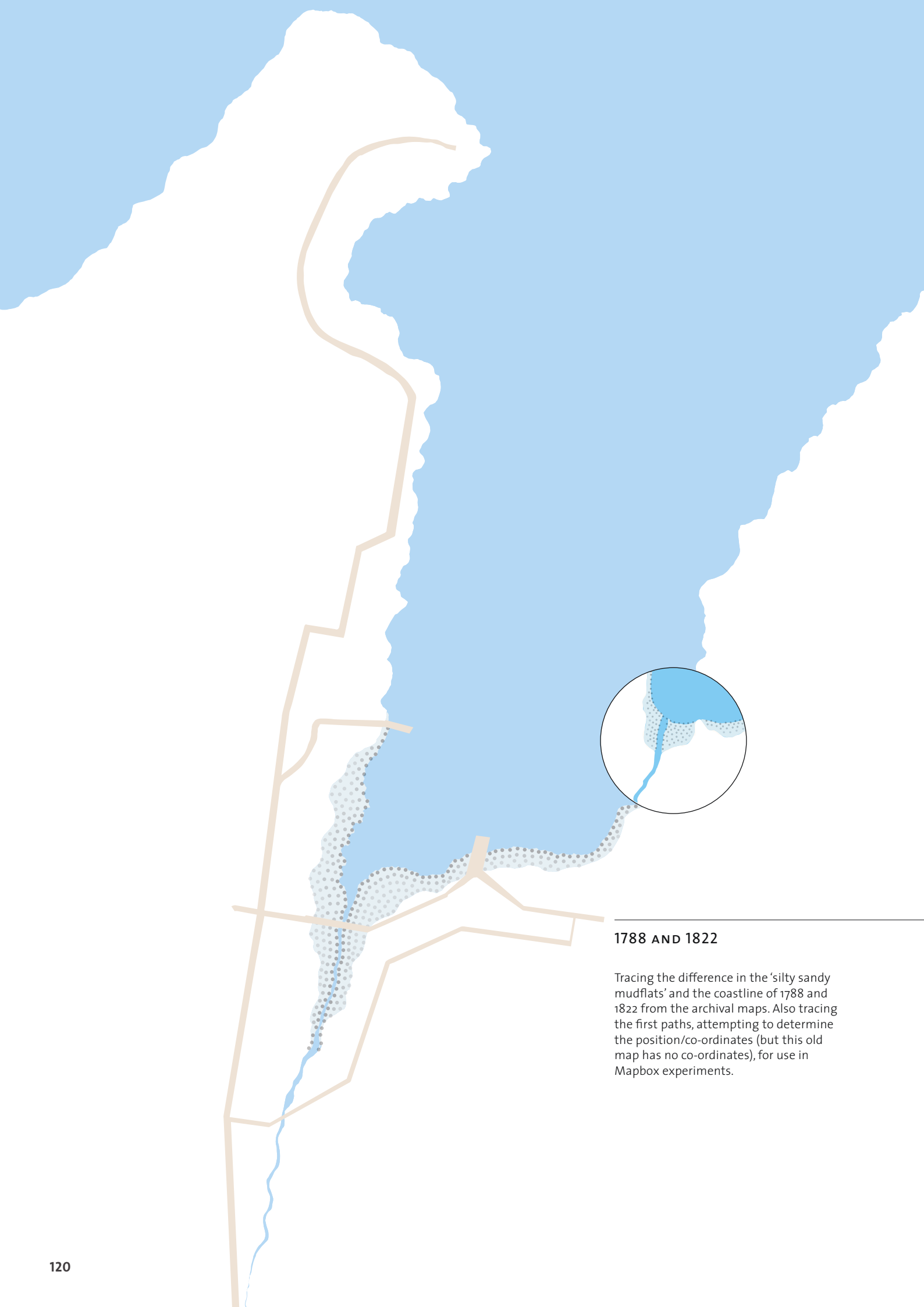
Please view the prototype at TypeTrails.com.au

It is very difficult to get lost in Sydney's city centre from a navigational perspective because the harbour locates you. From the city centre, Sydney is a slow downhill slope to the harbour Warrane (Circular Quay) – the gateway of the city centre, with a deep valley in between. When you are moving towards the harbour, Warrane locates you to where you are and orientates you. As mentioned in the contextual review (Chapter 3), the *Legible Sydney* wayfinding signage locates you, tells you where you are and connects you to amenities, transport and museums. In this part of Sydney, the landmarks are distinctive. There are also plenty of opportunities to get lost and become immersed experientially in the stories of place through museums, art galleries, the State Library, artworks permanent and temporary, environmental graphics and interpretive typographic information embedded in the urban environment and on private and public architecture, through heritage signs attached to architecture, through interpretive signage and through cultural and heritage-based walks via apps or guided tours[41]. My contextual survey found that there was very little in this area as wayfinding, interpretive signage or digital wayfinding that communicated the ecological history of this area; that there was no identity in the typographic approach in the current wayfinding systems of this area and little connection between physical wayfinding signage and digital wayfinding. The previous chapter presented a preliminary suite of experiments to creating storytelling approaches that could act as a critical probe for wayfinding design, and that used typography as a system for storytelling. All this led to the development of the prototype presented in this research.

41 Aunty Margret Campbell Dreamtime Southern X is a guided tour in this area connecting people to Aboriginal culture and history.

The prototype is geo-located and provides information about nearby trees and environmental elements of 1788 which converges with existing physical signage in the environment and could potentially be activated by design markers in that environment. If it were developed into a wayfinding experience in place, its aim would be to fit into the daily lives of pedestrians going about their daily activities and to catch the eye of passers-by through being positioned as ground-level graphics (markers) triggered by QR codes. Although the initial aim was for this prototype to be experienced through a location-based device such as a mobile phone in place, the Covid-19 lockdown forced me to work through this virtually. It therefore functions on two levels: it can be used in-situ or experienced virtually as an exhibition piece on a large screen not in place. I have taken the prototype to a point at which some aspects are still imagined.

◀ FIGURE 58
The study area: from Hyde Park to Warrane/ Circular Quay and from Macquarie Street to George Street.



1788 AND 1822

Tracing the difference in the 'silty sandy mudflats' and the coastline of 1788 and 1822 from the archival maps. Also tracing the first paths, attempting to determine the position/co-ordinates (but this old map has no co-ordinates), for use in Mapbox experiments.

AIM

The practice-based component of this research, *Type Trails*, aimed to critically probe the "hidden logic" (D. Gibson, 2009, p. 44) of the way we find our way around the city centre of Sydney based on historical, ecological and cultural information. It follows the invisible memory lines of the original coastline of Sydney, the Tank Stream and the original Aboriginal trade pathway of George Street (Troy as cited in Daniel, 2018) to tell a story of this area, with a primary focus on the trees and flora and on what lies underneath, revealing the very beginnings of Sydney's city plans and through this, the reasons for the ways in which we currently find our way in this area. It also aims to focus on the wayfinding experience of the journey through this storytelling content rather than reaching a destination or linking to a pre-determined walk or route. This wayfinding is experienced through words (typography). The prototype is a typographical map as the interface and exists as a digital wayfinding experience created as a system that could be curated by others.

The aim for the prototype *Type Trails* is to use typography to visualise, materialise and communicate storytelling and information through wayfinding design as an alternative to other ways of reading information in a city. In this prototype I explored different ways of reading text in digital mapping through exploring typographic structural relationships (Drucker, 2013). I explored ways of adding a dimensionality to the experience through exploring the affordances of the mapping software Mapbox), in particular, its fluidity and zoom functions. I explored ways of converging with signage in place through locating information in existing signage and environmental graphics and place-making and I explored ways of digitally wayfinding through typographic information that generously engages various literal sources. *Type Trails* also aims to use typography as a system in digital mapping for storytelling. I questioned how kinetic I could be and how much I could strip the digital map away from the cartographic representation of a bird's eye view map to make it experiential, to achieve a wayfinding experience of journeying, but through typographic information.

Situating the practice-based research

The wooded areas and forest were pushed back as soon as the colonials arrived in Australia (Gammage, 2011; Karskens, 2009; Pascoe, 2014). In this practice-based research I focused, as previously stated, on the inner-city business district area of Sydney from Hyde Park down to Warrane (War-ran, Wee-rong, Warrang[42], Sydney Cove, Circular Quay), and from Macquarie Street to George Street.

Also as previously stated, many of the main streets in Sydney follow Aboriginal pathways of trade and access to ceremonial places or places of resources (Troy et al., as cited in Daniel, 2018). Many of the streets and original Aboriginal pathways also followed the contours of the land or the ridges or the streams of fresh water (Foster & Irish, as cited in Daniel, 2018; Karskens, 2009). While Macquarie Street, situated on the highest ridge, appeared later, in 1810, as part of Governor Macquarie's attempt to regiment Sydney streets into a more military pattern, these other roads already had a fairly organic formation (Fitzgerald & Murray, 2009; Karskens, 2009).

42 The Sydney Barani website states that early maps and journals contain these different spellings of Warrane.

◀ FIGURE 59
Tracing the Tank Stream, the roads and the coastline from colonial maps of 1788 and 1822.

Jakelin Troy (Ngarigu) explains how Aboriginal pathways have shaped the city: "Actually the way Sydney is laid out now, it's mirroring and in fact using the boundaries and connecting thoroughfares that Aboriginal people used as well." (Daniel, 2018). Importantly, Dillon Kombumerri (Yugembir) and Danièle Hromek (Budawang/Yuin) also remind us, "We walk in the footsteps and live in the spaces of those who were here before and of course are still here" (2021, p.149).

Learning from an Indigenous perspective on designing in the public built environment through my applied design work (which sits outside of this PhD, as a collaborative design project for an Indigenous company (Djinjama) and under the guidance of the City of Sydney Council Indigenous leadership team[43]), has taught me that there is now a large body of research and accessible frameworks that are readily available. These include *Connection with Country* (Government Architect New South Wales, 2020a) and *Designing with Country* (Government Architect New South Wales, 2020b) for both non-Indigenous and Indigenous designers working in the built environment. This body of work produced by Aboriginal spatial designers, architects and researchers in collaboration with government staff and under the guidance of an advisory panel of traditional custodians (2020a, p. 3) is now easily accessible on the Government Architect NSW website and promoted by local and state governments. As a precursor to any built environment project, I endeavoured to be guided by this within this research. The redefinition of Lynch's categories for Sydney by Dillon Kombumerri (Yugembir/Goori) from an Indigenous perspective in *Connection with Country* (Government Architect New South Wales, 2020a) became a guiding principle for me in relation to paths and streams:

- paths: a recognition and understanding that many of Sydney's web of roads were originally Aboriginal pathways, including but not limited to George Street, Oxford Street, Pitt Street, Parramatta Road, Old South Head Road, King Street (Troy & Foster cited in Daniel, 2018; Kombumerri, 2019; Kombumerri & Hromek, 2021)and a focus on Aboriginal naming of the flora and fauna and geographical and ecological features of an area. The naming centres on landscape, flora and fauna rather than after people (Kombumerri, 2019)
- edges: a redefinition as landscape systems and water systems. The hydrological grid of the Sydney Basin and its underlying system of water, as well as harbours, rivers, streams, wetlands and "creek corridors" (Government Architect New South Wales, 2020b; Kombumerri, 2019)

In addition to this, I was guided by how I should consider working in this space as a practice-based researcher by Shannon Mattern's provocation in her 2017 article *Mapping's Intelligent Agents*, in which she says:

> We must choose our tools and methods wisely, fully aware of their affordances and limitations, sensitive to how they render the world knowable — and how they register and reflect the world as it is known to its many intelligent, invested inhabitants. Ideally, we should balance or juxtapose different modes of knowledge and production: Western scientific and indigenous epistemologies, human and other-species ontologies, mechanical and organic means of experiencing and representing place, cartographic rationalism and empiricism, projection and retrospection. (Mattern, 2017, para. 33)

43 This project is mentioned in the Appendix.

As mentioned in the methodology chapter 2, I used an RTD process as my mode of scholarly inquiry explored through a critical documentation process. The critical documentation aimed to examine and make visible the way the affordances and limitations of the Mapbox software that I was using "renders the world knowable" (Mattern, 2017). By identifying that technologies and digital wayfinding have produced new methods to (1) navigate and experience cities and (2) extend opportunities for immersive and experiential approaches to be implemented within wayfinding design, I worked through the practice-based enquiry to arrive at the following research questions:

1. how might a storytelling approach to urban wayfinding design be a critical probe?
2. how might we design local wayfinding systems for cities that provide a deeper and richer orientation to place?

Interpretation

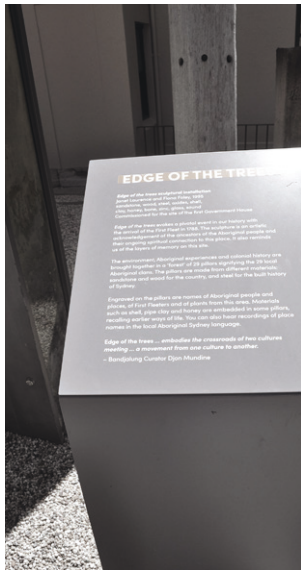
WORKING WITH ARCHIVES, HISTORICAL INFORMATION, EXISTING INTERPRETIVE SIGNAGE AND ENVIRONMENTAL GRAPHICS IN PLACE TO CREATE THEMES AND CONTENT

In addition to pathways, *Type Trails* also centres on flora. However, I chose not to locate *Type Trails* in the Royal Botanic Gardens, which is next to Warrane/Sydney Cove, as the storytelling is crucially positioned in the cove where the colonials first arrived and which has since become an urban centre. The curated nature of the Royal Botanic Gardens is another wayfinding enquiry and task and has separate needs and investigations, some of which overlap.

The artwork *Edge of the Trees* by artists Janet Laurence and Fiona Foley (1995), located in the forecourt of the Museum of Sydney, influenced my early enquiry into what trees were growing in this area in 1788 and what is left as remnant vegetation today. The Museum of Sydney signage written by Bandjalung curator Djon Mundine in 2019 describes how the "forest" of 29 pillars signify the 29 local Aboriginal clans and

FIGURE 60
Edge of the Trees by Janet Laurence and Fiona Foley, 1995.





"embodies the crossroads of two cultures meeting ... a movement from one culture to another". In 2018, I worked with Sydney Living Museums on a student partnership with Nerida Campbell, a SLM City Curator, using a text written by Aiesha Saunders, who at that time was the SLM Coordinator, Aboriginal Interpretation Projects, for a student studio wayfinding project. This project prompted me to investigate what should grow here. Situated in this forecourt now is the Yana Nura garden growing native plants that should grow in this area and accompanying signage displaying D'harawal knowledge in relation to the plants, developed in collaboration with the Sydney D'harawal Knowledge Holders Circle. These plant names are incorporated into the *Type Trails* map.

The information in *TypeTrails* is drawn from archival research; it also taps into information from reports and books produced by Sydney City Council, the Government Architect New South Wales and the Royal Botanic Gardens. Several authors, namely Aunty Fran Bodkin[44], Bruce Pascoe, Grace Karskens, Bill Gammage, Doug Benson and Jocelyn Howell, are prioritised for their focus on the ecological history of 1788 and their historical and cultural research, which gives depth and insights into what has shaped the way we currently wayfind in this area. In her comprehensive 2009 history of this area, *The Colony*, which focuses on the formative years of colonisation in Sydney, Grace Karskens states:

44 Elder Frances Bodkin is a descendant of the D'harawal people of the Bidiagal clan.

> It was shaped by the sinuous "desire lines" made by walking feet as much as the straight lines plotted on maps; by the independent movements and appropriations of people, as much as official directives and grants. (Karskens, 2009, pp. 3–4)

In addition to the movements of "walking feet", bringing attention to the "original vegetation" and "natural features" of this area conveys a sense of how this area has been transformed over the last 200-plus years, of what lies beneath the concrete and bitumen (Karskens, 2009) as undisturbed pollen or buried streams and what is left as remnant trees. *Type Trails* also emphasises the fact that this area is now unrecognisable from its 1788 state and hard to imagine. Very little remnant vegetation remains in this area and the biodiversity has been greatly reduced. The *City of Sydney Urban Ecology Strategic Action Plan* states, "Almost all of the original vegetation and other natural features have been removed or modified". (2013, p. 8). In other words, the vegetation community has been completely removed from this area apart from pockets in the Royal Botanic Gardens and the Domain (Benson & Howell, 1990b). In my own research through archives, signage, exhibitions and significant tree data, through books and tours, I could locate only one native "significant" tree in this area, a Port Jackson fig *(Ficus rubiginosa)*, which was planted in 1915 outside the State Library. Just outside the four main roads that define my study area, in Wynyard Park, there is another Port Jackson fig. On the cliffs above the Opera House there are also native trees and flora; Sydney red gum, also known as smooth-barked apple *Angophora costata,* are growing alongside two large forest red gum *(Eucalyptus tereticornis)*, thought to be remnant trees (Ruting, 2015), and fork fern *(Psilotum nudum)* still clings to the sandstone rockface above the Opera House. Benson and Howell note that, "Other early views show the town with virtually no native trees, or with perhaps a characteristically deteriorating tree for artistic effect" (Benson & Howell, 1990a, p. 44).

> Since European colonisation in 1788, the original vegetation of the LGA has been almost completely removed as a result of urban development and associated activites [sic] including shoreline reclamation, filling of swamps, and channelisation of watercourses including the Tank Stream in the city centre, Shea's Creek (now Alexandra Canal), Johnstons Creek and Rushcutters Bay Creek. The LGA is now largely characterised by high-density residential, commercial and industrial land uses, with open space largely dedicated to recreational use. Four of the likely original vegetation communities, Sydney Turpentine Ironbark Forest, Eastern Suburbs Banksia Scrub, Coastal Saltmarsh, and Sydney Freshwater Wetlands, are all now listed as endangered under NSW and/or Commonwealth legislation. (City of Sydney, 2013, p. 20)

RESEARCHING CONTENT: FRAGMENTS FROM ARCHIVES AND AUTHORS

Type Trails uses content from city archives, exhibitions, signage, books, websites, ecology reports, early botanical books on Sydney, poetry and recordings. A full list of this can be found in the *Type Trails* references.

Digital mapping and mapping practices

In this practice-based component I drew on the research of Harry Heft, the previously mentioned psychology scholar, who argues that wayfinding is temporally structured (Heft, 1996, p. 105) and that wayfinding is learnt through the social-cultural and environmental conditions of place (Heft, 1996, 2013). I also attempted to create a temporal experience in the way in which the information is displayed through the kinetic experience of the type, in which words and paragraphs fade quickly into other words and paragraphs in a fleeting manner. This drew on Heft's argument that wayfinding is temporally structured and that wayfinding over familiar trails involves "the detection of information over time that is specific to the surface layout of a particular path of travel" (Heft, 2013, p. 24). In this practice-based enquiry I also re-imagined Heft's idea that wayfinding includes "the detection of stimulus information specifying environmental features" (Heft, 1996, p. 126) through including "stimulus information" that describes elements in the environment that were there in 1788 but are no longer. Occasionally it references the present, through quotations that reflect the significant trees and existing native flora or that refer to signage in place.

In her 2017 doctoral thesis *Living the Map: Mobile Mapping in Post/colonial Cities,* Clancy Wilmott undertook a user-based ethnographic and archival enquiry into the two post-colonial cities of Sydney and Hong Kong, exploring the performative nature of new mobile practices to sit them in the "everyday". She extended on this in her 2020 publication *Mobile Mapping Space, Cartography and the Digital*. In both of these research outputs she used the research from a series of user-based performative "wanderings" "as spatial stories", observing how:

> ... the geological, hydrological and ecological landscapes of Sydney interminably structure and restructure urban space, and in so doing, they also structure spatial experiences, and thus, the unfolding of everyday mobile mapping practices. (Wilmott, 2020, p. 82)

In her thesis, Wilmott explored how cartographic mapping practices also underpin mobile mapping practices, stating "The resonances of the systems through which colonisation was undertaken bleed into present mobile mapping practices" (2017, p. 15).

45 Cartography has its origins in Ancient Greece [Cartography Exhibition of Sydney, 2019]

Cartography, a westernised way of navigating[45], organises space and is often caught up in "the same concern with the occupation of space with 'getting there first' and leaving one's mark" (Ingold & Vergunst, 2008, p. 6). Leszcznski, too, reflects: "Throughout history, maps have produced rather than depicted the territories they purport to represent" (Leszczynski, 2015, p. 6). Mattern reminds us that "Of course, the history of cartography is deeply entangled with stagecraft and colonialism, and the claiming of Other lands and the erasure of Other people" (Mattern, 2017, para. 23). This is particularly relevant to Australia and New Zealand, where maps and journals became a surveying tool for land claim (R. Gibson, 2014; Rogers, 2021). Cartographic maps, cartographic mapping practices and data are inherently partial (Kurgan, 2019, p. 7), they are "instruments" "of the exercise of power" and should be understood for the constraint they have in representing only particular points of view and for what they omit (Kurgan, 2019, p. 11).

> Maps, and the technologies and imaginations used to produce them, are instruments of power (Harley 1989). Not of power but of the exercise of power in conflicts, relationships, encounters, challenges, battles, protests, and subversions. Maps are never just navigational aids or aesthetic objects; they live essentially in the force field of social, economic and political struggle. (Kurgan, 2019, p. 11)

Ross Gibson notes that Kurgen has a provocation in her own work to "put the project of orientation–visibility, location, use, action and exploration–into question … [but] without dispensing with maps" (Kurgen, 2013, p.17, as cited in Gibson, 2014, p. 253). This became a provocation for me to use mapping software as a form in my practice-based research. In addition, Anne Burdick, Johanna Drucker, Peter Lunefeld, Todd Presner and Schnapp Jeffrey in their pioneering book *Digital Humanities* (2012) propose how digital maps can make an argument and rather than seeing them as "static representations" they can be used to dissect, contest or re-invent mapping conventions.

> Within a dynamic, ever-changing environment, new data sets can be overlaid, new annotations can be added, new relationships among maps can be discovered, and, perhaps most importantly, missing voices can be returned to specific locations through "writerly" projects of memory that the participatory architecture of Web 2.0 applications has made possible. (Burdick et al., 2012, p. 47)

Mapping practices in Aboriginal culture are a reflection that "Indigenous knowledge is inherently spatialised, as it is related to recurring processes, site specific knowledges and is embedded into the landscape through the names and stories of places which contain the meanings, relationship and interconnectivity of a place" (Pearce & Louis, 2008, as cited in Kombumerri & Hromek, 2021, p. 149). Contemporary Indigenous mapping practices have also re-invented, deconstructed and counter-mapped western approaches to organising space. Counter-mapping is a term used to explain practices that centre on adding storytelling to a map. The A:shiwi people in central USA have recently used counter-mapping to educate their younger population in language and

story which had been largely lost to them and their highly illustrative approaches have become a successful tool in the cultural education of their youth (Steinauer-Scudder, 2018). Artist Christine Rogers (Ngāi Tahu/Pakeha) stitches history and story back into a map of Christchurch from her own personal memory, taking her mapping reference from an early 1841 Ngāi Tahu map of the South Island (Te Waipounamu) which was created by three male Ngāi Tahu members and organised by an early colonial government official. The original map, which has since been lost although a copy of it does exist in the Te Ara Encyclopedia of New Zealand, contains original naming and highlights the way the Ngāi Tahu navigated through the orientational approach of the resources and natural features relevant to their cultural lives. This included such aspects as where to find the best seals and the best harbours to land in certain weather conditions (Rogers, 2021). Indigenous communities also work with new technologies in digital wayfinding and storytelling in new and inventive ways. For example, the Aṉangu people worked with Google Australia to produce a "storysphere" for the Uluṟu-Kata Tjuṯa National Park National Park, using Google Street View to share their storytelling and send a strong message of their spiritual and political connection to Country (Mattern, 2017).

In relation to other forms of mapping, pavement chalkers of weeds in the UK and France adopted a performative and community-based ephemeral approach to highlighting an ecological issue. Boris Pressiq, a botanist in Toulouse and Paris, created a public dialogue and educated his students by chalking the names of mainly native wildflowers and plants that grew through the pavement (Morss, 2020). Separate to this, "botanist and campaigner" Sophie Leguil of "more-than-weeds" in the UK chalks the names of weeds on pavements, opening up a public dialogue about why pesticides should not be used on pavements worldwide and a public awareness of the importance of these small plants that we consider "weeds" (Morss, 2020). This became a kind of typographic wayfinding experience in place, a trail of vernacular lettering that invited dialogue about previously unwanted plants. Alexandra Crosby and Ilaria Vanni Accarigi explore the role of visual communication in making plant ecologies visible in a city through their mapping practice of "mapping edges", participatory walks that invite a re-reading of a city. They explore a new mode of mapping the city through the lens of recombinant ecologies (ecologies based on human invention), which provides new understandings about the liveability of the suburbs investigated and new ways of looking at neighbourhoods through the lens of plant life. (Vanni & Crosby, 2020).*Type Trails* aims to open a dialogue about endangered vegetation in Sydney but through wayfinding through information related to 1788.

The remainder of this chapter presents the dialogue in practice from the critical documentation process (Sadokierski, 2020) of this research, the insights I have gained and the methods as they have arisen out of the iterative process of the practice-based research. Critical documentation enabled me to understand, dissect, critique and discuss the complexities and enquiries embedded in my creative practice. Evidence of internal dialogue with self (Grocott, 2010) is also scattered throughout this document/research as pivotal moments of insight from reflection, or insights on the digital materiality or affordances and limitations of the software I was using. These fragments of insights or journaling notes were used to critically analyse my design process. They demonstrate my thinking through the making and how this helped me form the main arguments of this research.

Critical documentation: design methods and insights

RE-TRACING MY STEPS

Underpinning the process of making this prototype is an enquiry into how digital wayfinding can converge better with physical signage. Leszcynski argues for an understanding of spatiality not to be looked at as a separation in hybrids between the physical and the virtual space but instead to be thought of as "the *effect* of the multiple, contingent, never complete comings-together of persons, technical presences (spatial media) and space/place" (Leszczynski, 2015, p. 19). I did not manage to achieve a seamless transition between the physical and the virtual in the prototype and using it *in situ*. However, after getting to a fairly completed stage of the prototype, I re-read Leszynznski's 2015 paper and realised that I needed to re-think how I was approaching my design. I retraced my steps in this situated area that I had already walked many times in the course of this research in an attempt to critique the walking experience offered by the prototype. In the process, I realised that I needed to document the interpretive signage, the significant trees and the native plants and artwork in this area that linked to the themes embedded in the prototype but which I had not previously documented in the environment. I then found ways of locating fragments of text from the signage back into the map or ways of ensuring that specific locations converged with relevant typographic information in the area.

In seeking to answer questions of how digital wayfinding systems could converge better with signage in place, I investigated this through my teaching as well, in a series of briefs developed for student partner projects with the City of Sydney and Sydney Living Museums. Through this, I aimed progressively to develop a wayfinding model that focused on storytelling and explored different ways in which the digital storytelling experience could relate to the physical signage. The students created a theme, researched stories and narratives of the situated place guided by curators and Indigenous artists, researchers and professionals and designed a way of connecting the storytelling through a wayfinding experience in the area through a speculative digital application, physical signage or through environmental graphic design.
This was not new; a lot of wayfinding design already uses these approaches, including the precedents mentioned in the contextual review, Chapter 3, Section 1. What was critical for my own research and development was that I observed the students tending to use a "seek and find" game-like or rewards-based storytelling model for the experience. This again was nothing new and the contextual review outlines how this has been explored by artists and designers in interesting and innovative ways. However, it highlighted to me not only the success of game-like storytelling strategies for digital wayfinding but also a desire to find an alternative way to work through a storytelling experience digitally. I have therefore attempted to provide an alternative, non-linear typographic system as a digital wayfinding experience.

Digital wayfinding themes are often categorised and experienced as distinct layers that do not interlink fluidly. In *Type Trails*, I wanted to look at how that experience could become a fluid experience and not a rewards-based game-like experience, how the information could contain many authors' voices and intersect in a non-linear way.

USING THE METHOD OF TRACING AS A PROCESS

Through their ability to track activity, fitness and walking apps trace the route of runs and walks and some of them allow us to graphically and visually review the shape of our journey. The shape of the walk is a side-product of the user-based ability to share routes taken, and an interest in the difficulty of the run or walk and the distance. However, it is also an interesting visualisation device in communicating this data. Thinking about the graphic representation of an activity through these digital means led me to a fascination with the visual and graphic shapes of the original pathways that formed the main streets of Sydney. It is a form of tracing the walking activity along George Street, Bridge Street, Macquarie Street and Pitt Street from early colonial maps as they developed. In tracing and dissecting early colonial maps of Sydney I eliminated all the content I was not investigating and then looked at the marks that were left and the clues they gave as to how the roads developed. This was traced from early colonial maps of Sydney up until the point that the Tank Stream disappeared from the maps (dates are included in Figures 62 and 63). The 2018 graphic was then traced from Google Maps. The Tank Stream was also traced and the street names in each colonial map noted. The tracing was done digitally using Adobe Illustrator.

The method of tracing is an integral drawing device and a "performative" and "gestural" act in the critical 2015 design research work of visual communication designer Jacqueline Gothe. Gothe uses tracing through a "co-constructed process" in collaborative projects to reveal "underlying structures, arguments and assumptions of an issue" (p. 63). Tracing is a design approach where she is able to position "the ground" as instrumental in informing the process of the work or project:

> The action of tracing is associated with a loosening of the emphasis on the identity of the designer as professional individual. It requires a less directive focus and a less outcome-oriented approach relying on the morphology of place as guide. Rather than positioning design as instrumental, professional and expert, a less authorial and more relational and affective connection to the ground is emphasised. (Gothe, 2015, p. 67)

Using tracing in my practice has had important implications for my research. Through analysing how the streets were formed I could dissect how this might be used in a time-based experience and the relationship to the way we currently wayfind around this area, through investigating the graphic form of how they grew. It also positioned "the ground" as an important process in informing the work (Gothe, 2015) and the history of these pathways informed (and informs) the graphic shapes of my work. These traced pathways thus became the lines from which the kinetic letterforms and words appeared in *Type Trails*.

CONVERGING WITH SIGNAGE IN PLACE

FIGURE 61 ▶
A re-walking and re-documenting of the area to capture the relevant interpretive signage, significant trees and native flora.
▼

REMNANT TREES & NATIVE PLANTS

Yana Nura garden displaying native plants and D'harawal knowledge on signage developed by Sydney Living Museums in collaboration with the Sydney D'harawal Knowledge Holders Circle.

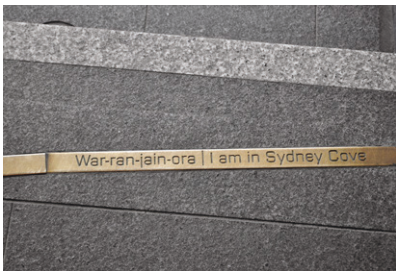
Angaphora Costata, Sydney Red Gum above the Opera House.

TANK STREAM SIGNAGE

Commercial signage in Tank Stream Way displaying the name.

ADAPTED COASTLINE MARKERS

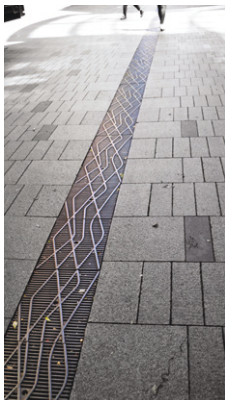
Environmental markers indicating the shoreline in the pedestrian walk-through next to the Ernst & Young Building.

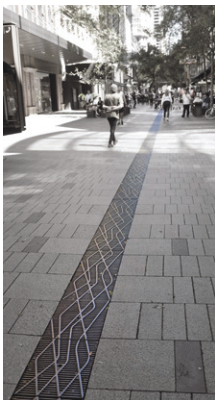


Port Jackson Fig listed in the significant tree register outside the State Library.

City signage for Tank Stream Way.

Environmental Graphic and drain indicating Tank Stream in its current form as a storm water drain.





Jesse Street Garden signage with early colonial map and images displaying the waterfalls of Tank Stream.

Environmental markers indicating the 1788 coastline around Circular Quay.

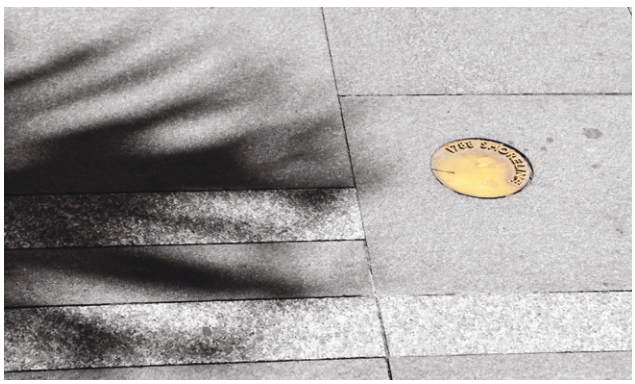


FIGURE 61
A re-walking and re-documenting of the area to capture the relevant interpretive signage, significant trees and native flora.

TRACING THE DEVELOPMENT OF ROADS FROM EARLY COLONIAL MAPS

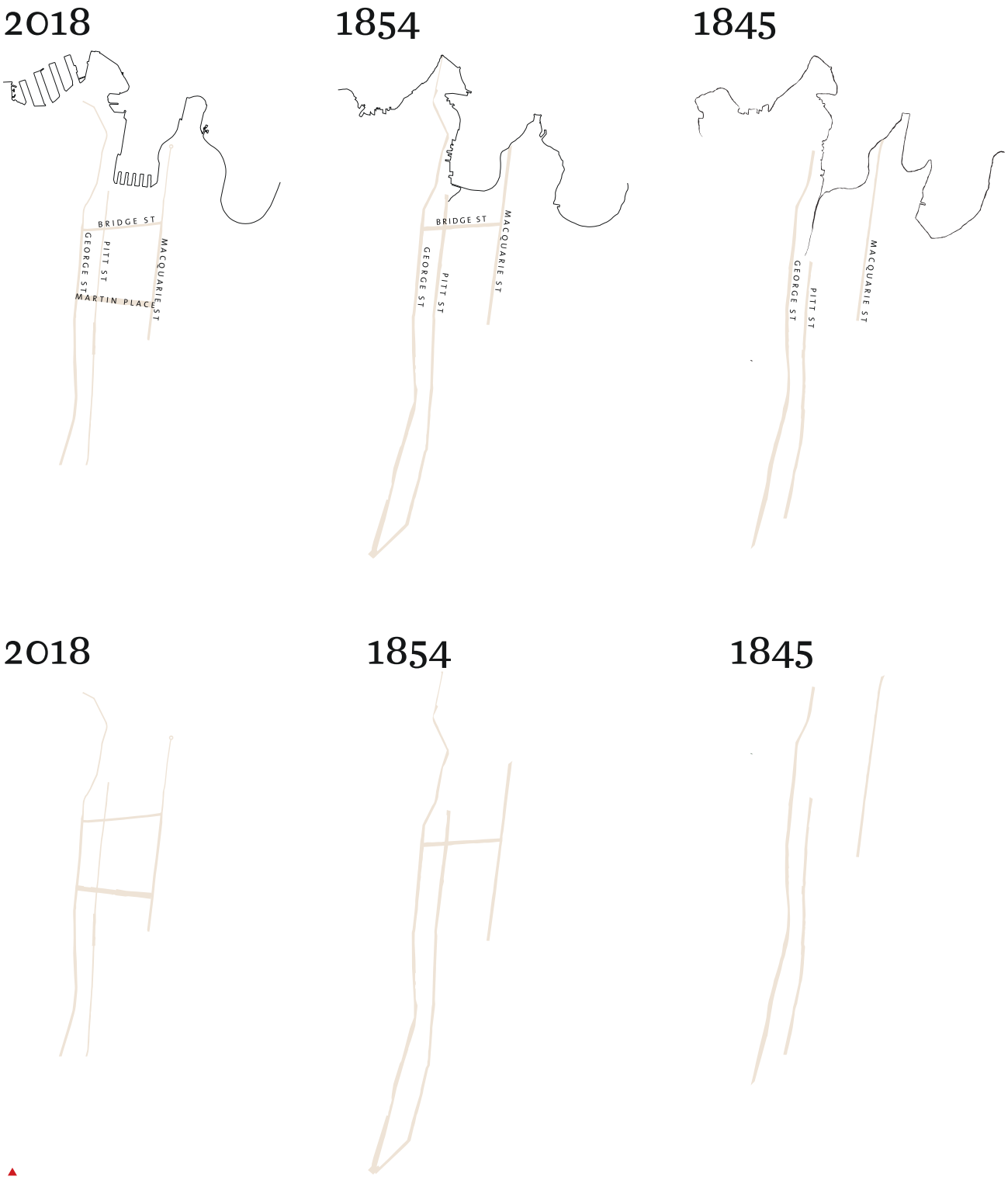
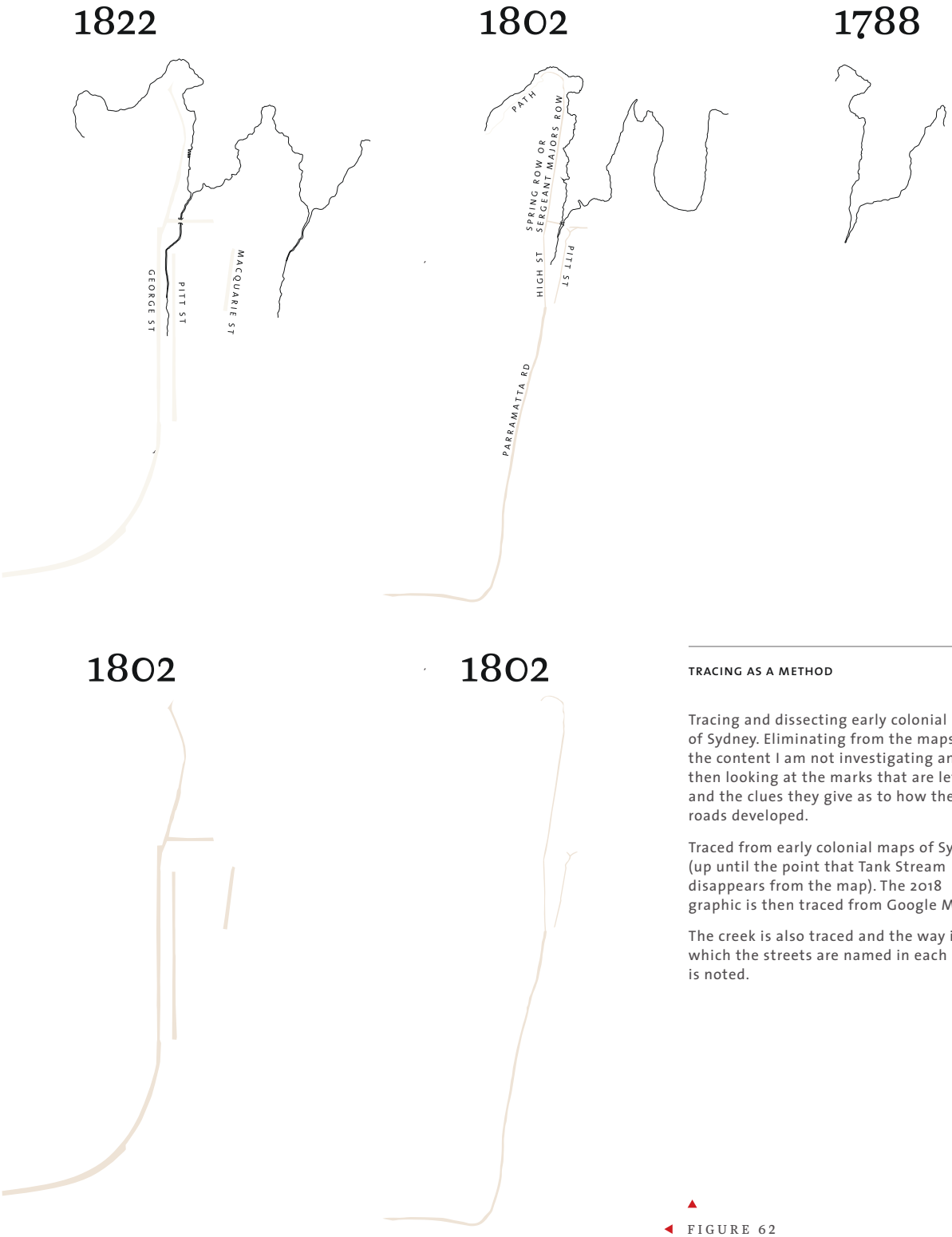


FIGURE 62
Page from critical documentation – tracing the development of George Street, Pitt Street, Bridge Street and Macquarie Street.



TRACING AS A METHOD

Tracing and dissecting early colonial maps of Sydney. Eliminating from the maps all the content I am not investigating and then looking at the marks that are left and the clues they give as to how the roads developed.

Traced from early colonial maps of Sydney (up until the point that Tank Stream disappears from the map). The 2018 graphic is then traced from Google Maps.

The creek is also traced and the way in which the streets are named in each map is noted.

FIGURE 62
Page from critical documentation – tracing the development of George Street, Pitt Street, Bridge Street and Macquarie Street.

TRACING AS A METHOD

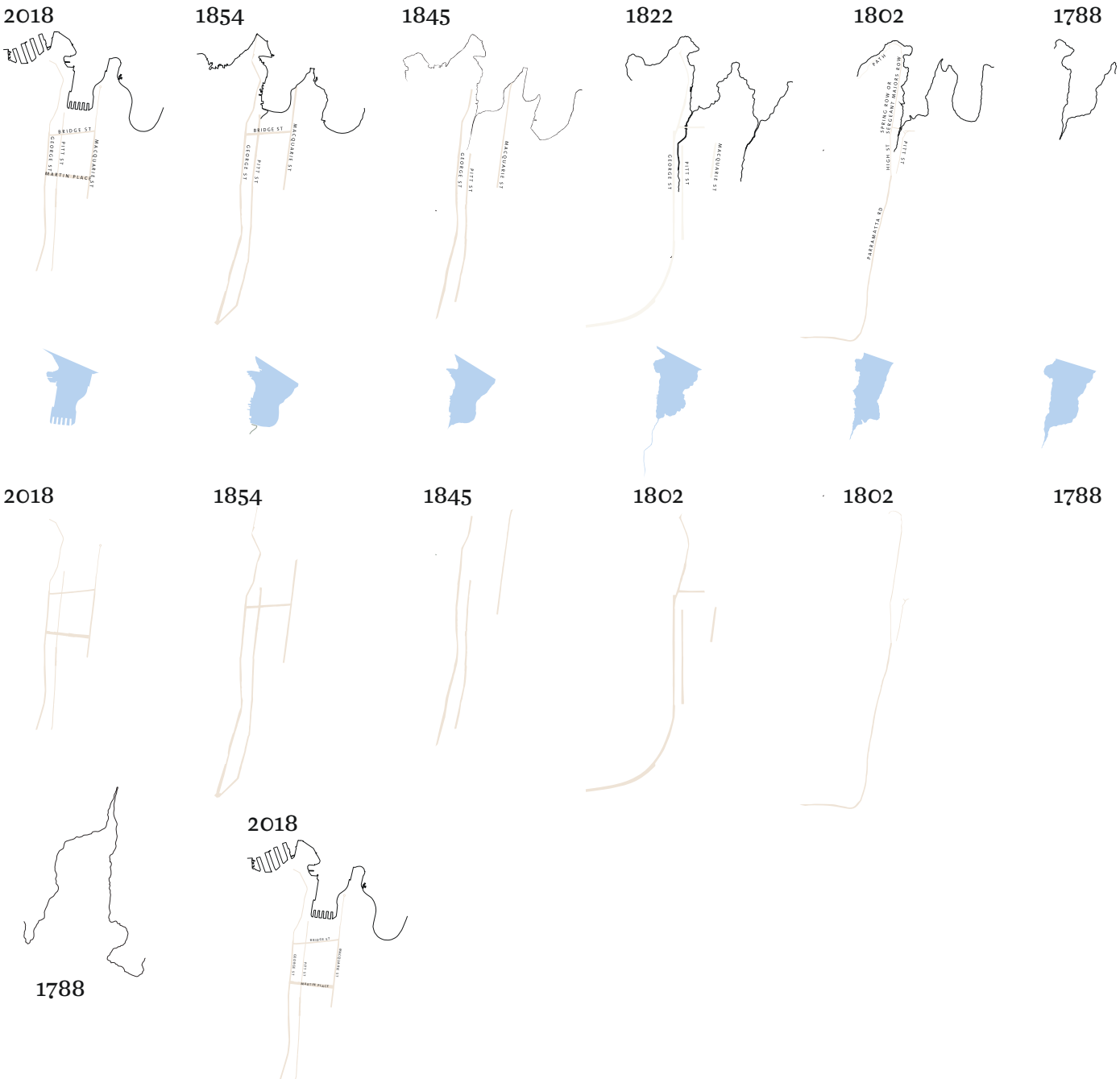


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FIGURE 63
Page from critical documentation – tracing the adapted coastline, the Tank Stream and the development of the roads.

SHAPES OF INFRASTRUCTURAL CHANGE

This began as an investigation into what tree references exist in the early colonial maps of Sydney. Finding very little information about trees apart from the occasional illustrative tree form within these maps, the focus changed to examine how the shape of the fore-shore area changed so rapidly and dramatically from 1788. The streets within the area chosen for this wayfinding system are also traced to show how they developed.

ALTERED COASTLINE

I came across this map of 1873 which is a comparison with a map from 1802 and 1873 from the State Library collection. The reclamation of land along the foreshore is extremely evident.

Sydney Mail. (1873). *Map of Sydney showing in contrast the town of 1802 with the city of 1873 [cartographic material]: supplement to The Sydney Mail* [map]. National Library of Australia. https://catalogue.nla.gov.au/Record/1974299

INSIGHTS

Of interest to this study is how the coastline has changed over time, how some of the creeks have disappeared, how the streets have remained largely in the same positions and named the same.

It is evident that in the very early days of the colony the streets navigated around obstacles in the landscape.

The map above was an interesting find after I had begun this process. The inaccuracies of the early colonial hand-drawn maps also become apparent when tracing these maps. Tank stream is not always drawn in full in the very first maps. Sometimes it is only drawn to the head of the spring but it would have worked its way all the way up to Hyde Park, ending in a swampy wetland between King Street and Park Streets (Mueke, 2016).

The shapes of the coastline are also always drawn slightly differently in the early maps.

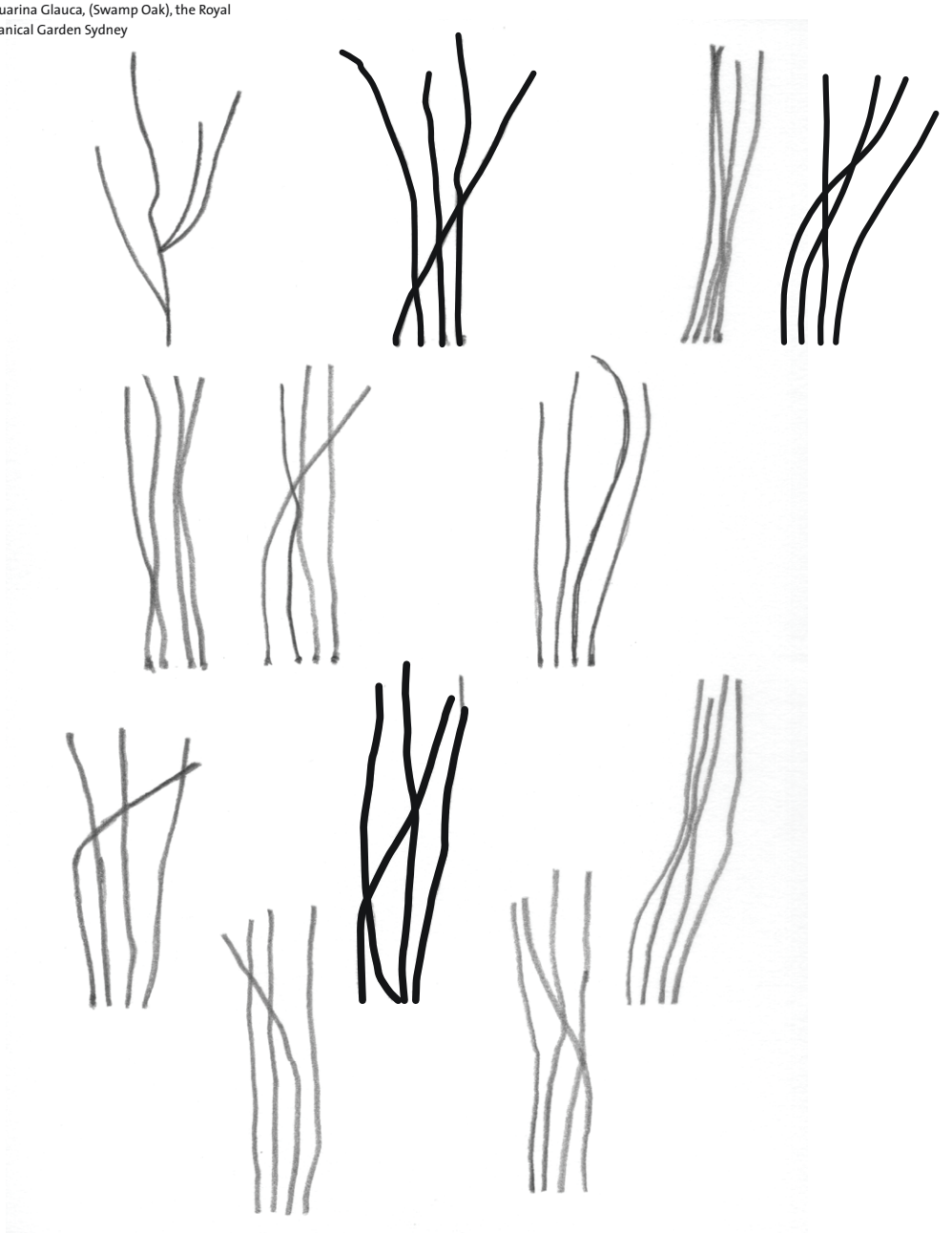
FIGURE 64
Page from critical documentation in which I traced an 1873 map which had a comparison with 1802. I used this as a shape for a trail of letterforms.

RESEARCH INTO WHAT TREES WERE PRESENT IN 1788

Casuarina Distyla, (Shrubby She-oak), *Native Flora of New South Wales*

Casuarina Glauca, (Swamp Oak), the Royal Botanical Garden Sydney

Caroline Simpson Library & Research Collection, Sydney Living Museums.



▲
FIGURE 65
Examining the remnant Casuarina glauca (Swamp Oak) trees in the Royal Botanic Gardens Sydney and the Allocasuarina distyla (Shrubby She-Oak) in early botanical journals. Exploring line drawings based on their needles.

FIGURE 66 ▶
Explorations of how a typographic map that gives information about the trees could work.

LOOKING AT POLLEN TRACES FROM AN ARTICLE ABOUT ARCHAEOLOGICAL SOIL ANALYSIS OF PART OF THE GARDENS OF FIRST GOVERNMENT HOUSE AND EXAMINING THE EARLY BOTANICAL RARE BOOKS AT THE CAROLINE SIMPSON LIBRARY

90% of Pollen traces 1788

Latin name	*Google name*	*Gadigal name*
Eucalyptus	Gum trees	
Casuarina	Ironwoods	

Pollen traces 1788

Banksia	Banksia	} *Higgenbotham, E., MacPhail, M. & Davey, B. 1988. 'The Soil and Pollen Analysis of Part of the Gardens of First Government House, Sydney' Australian Historical Archaeology, no. 6, pp. 49–56.*
Monotoca	Monotoca	
Compositae	Daisy	
Cyperaceae	Sedges	
Liliaceae	Lilies	

Types of Eucalyptus 1793

Eucalyptus Resinifera	Torumba	} *Smith, JE, 1793. A Specimen on the Botony of New Holland. Printed by J. Davis, published by J. Sowersby. London.*

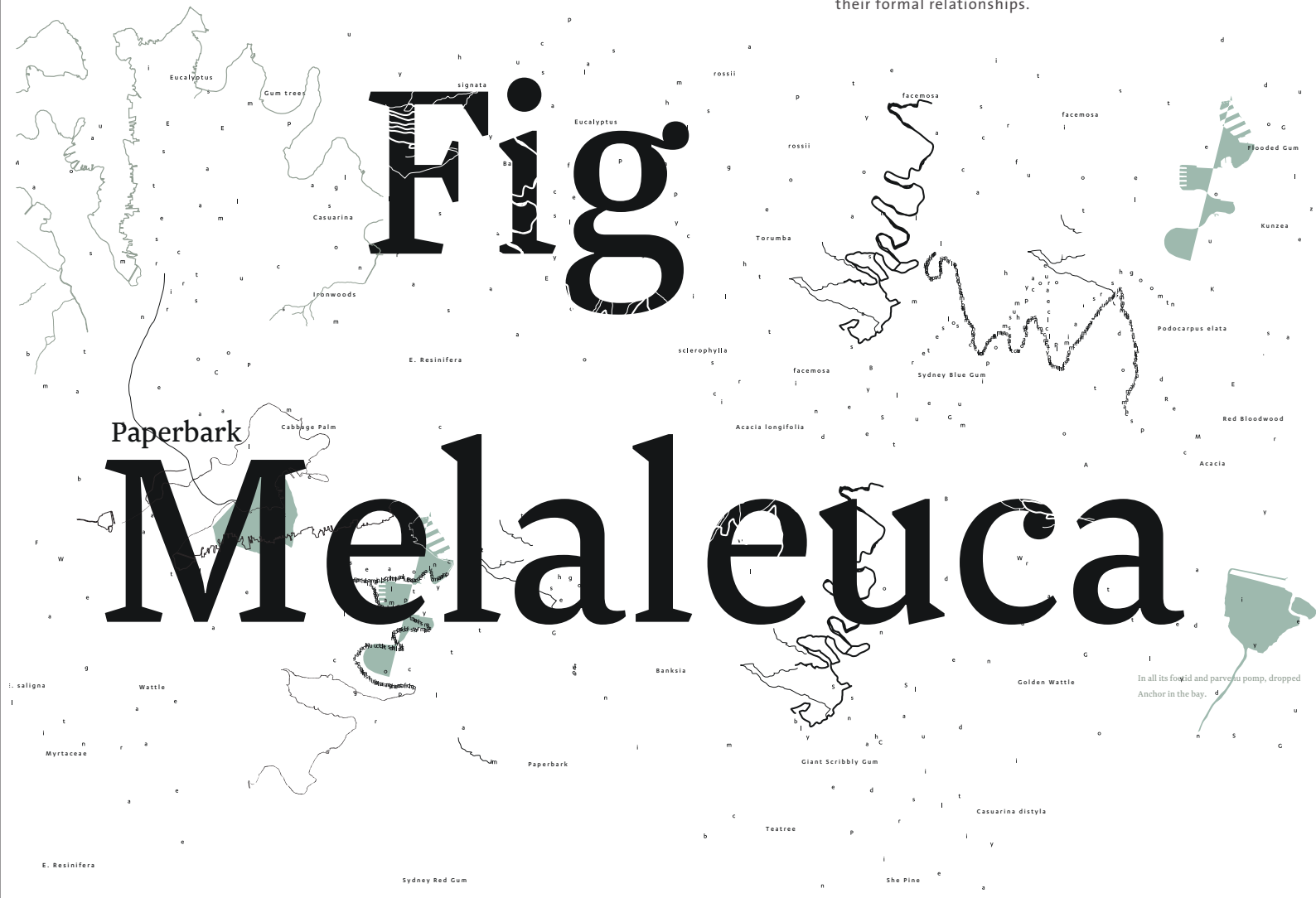
Smith, JE, 1793. *A Specimen on the Botony of New Holland.* Printed by J. Davis, published by J. Sowersby. London.

TYPOGRAPHIC EXPLORATIONS

Explorations into how this could work as a typographic map, with the intention of words popping out of letterforms and the idea that this could link to live data sets on trees in the current area.

Playing with a large contrast in the title size from the information in very small type, in order to pull a viewer into the smaller detail and to give contrast.

The broken and abstracted tracings of the old maps are illustrative and used for their formal relationships.



RESEARCHING ARCHIVAL MAPS

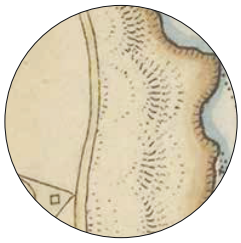
ECOLOGICAL DETAIL IN EARLY COLONIAL MAPS

Examining the shapes of the stream and the mudflats and the overlapping sandstone shelves, looking for information on the treelife but this is all very illustrative and not scientifically accurate

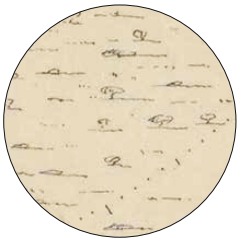
Silty, sandy, mudflat at head of Tank Stream

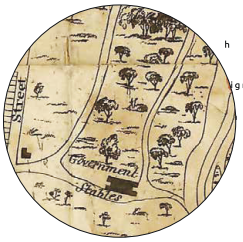
Indication of two springs in Tank Stream

Silty, sandy, mudflat at head of Tank Stream and 'Fresh' water



Overlapping sandstone shelves on highest Ridge of Mrs Macquaries Rd



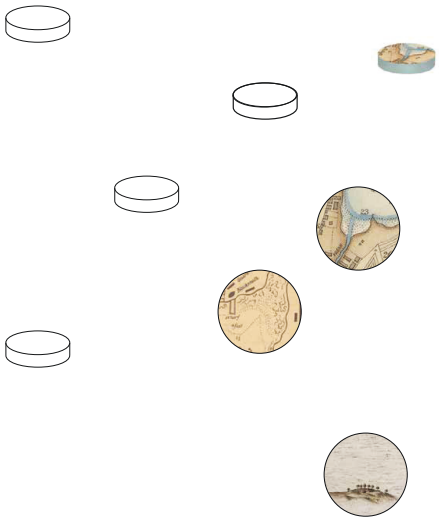


Illustrative forms of trees in early colonial maps

MAP REFERENCES P. 173

IDEAS FOR THE LINK BETWEEN THE DIGITAL AND THE ENVIRONMENT

Thinking through ideas on environmental markers using LED lights that could trigger a digital map.



ENVIRONMENTAL MARKERS AS LED

▲

FIGURE 67 ▶

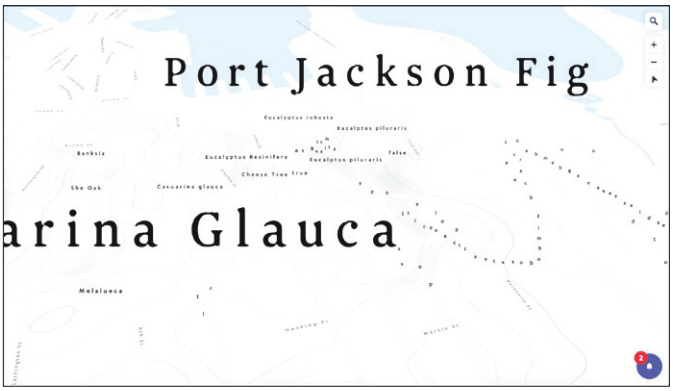
Examining the illustrative information in the colonial maps on trees and landscape features and early illustrations for a typographic map.

CREATING A VISUAL LANGUAGE

Investigating how trails of letterform could play a role as a graphic element in a map or a wayfinding system and investigating scattered letterform as a visual metaphor for pollen.

FIGURE 67
Examining the illustrative information in the colonial maps on trees and landscape features and early illustrations for a typographic map.

DEVELOPMENT OF A DIGITAL MAP



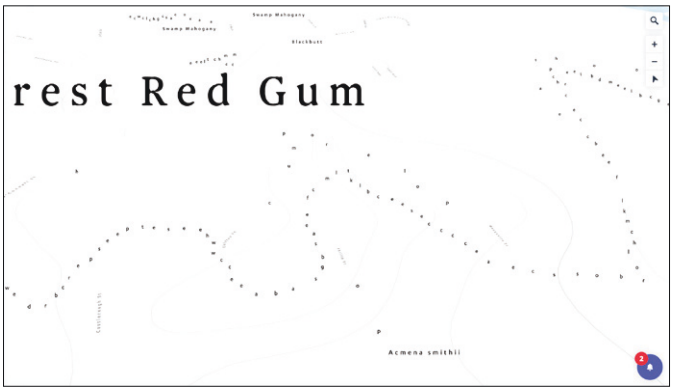


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FIGURE 68 ▶

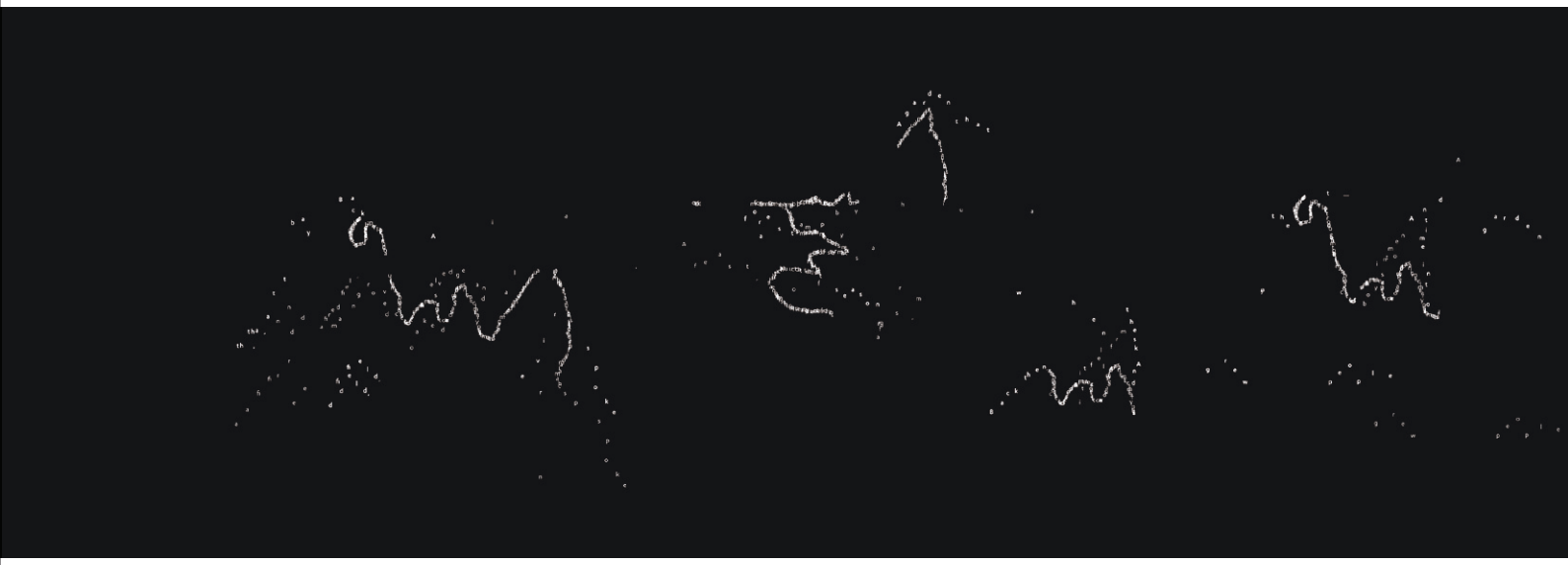
Pages from critical documentation – creating trails of letterforms in Mapbox and working through the hierarchical structure of the typography. I also placed the colonial maps over the Mapbox base map to trace the original coastline and related this to the environmental markers that are currently in this environment.

PROCESS

The visual language that had been explored in a static way was taken into the digital mapping software. Inside the mapping software the original coastline from 1788 and the line of the Tank Stream were traced with letterform following the old colonial maps.

To attempt to create a digital materiality in this work I have utilised the affordances of the mapping software.

FIGURE 68
Pages from critical documentation – creating trails of letterforms in Mapbox and working through the hierarchical structure of the typography. I also placed the colonial maps over the Mapbox base map to trace the original coastline and related this to the environmental markers that are currently in this environment.



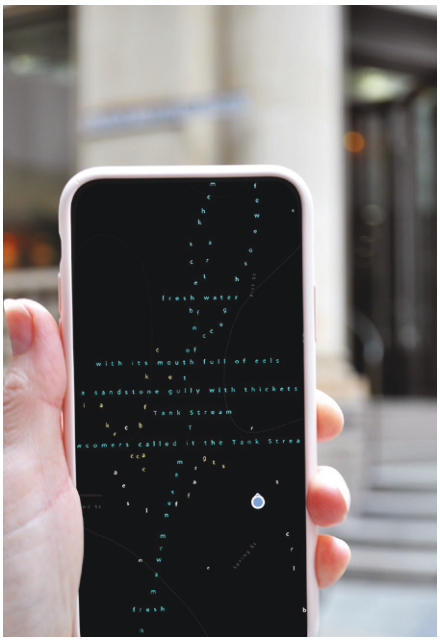
PROCESS

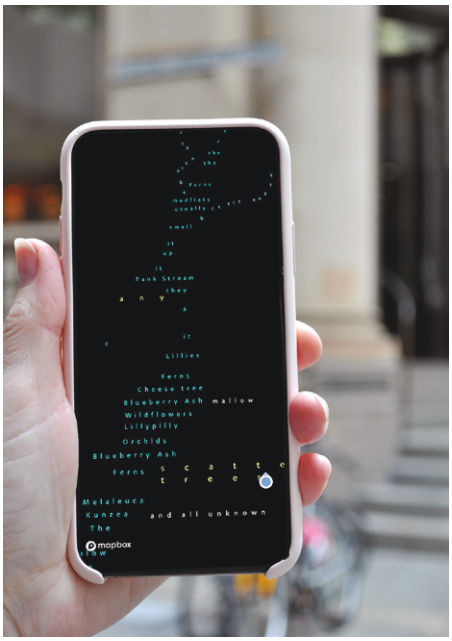
Design explorations into how text could kinetically move or how sentences could appear to pop out of small letterforms.

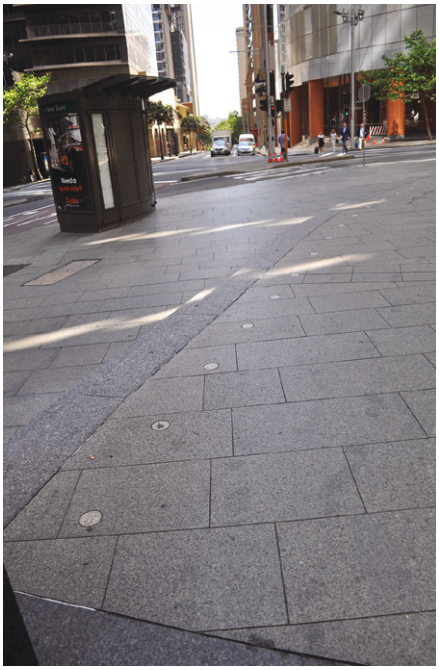
Initially the map of the area was evident. To take away the sense of this existing as a cartographic representation, I blacked out the background and left only a few scratchy remains of the detailing of the roads.

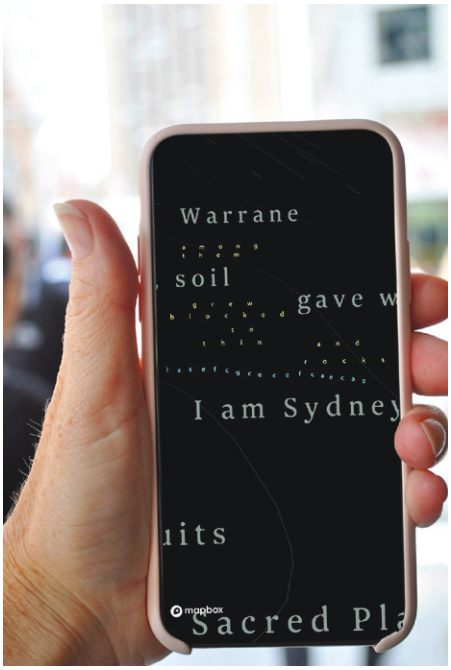
PHOTOSHOP MOCK-UPS

Designing mock-ups to determine whether this would work at a large exhibition, touchscreen scale and at the smallest screen size of an Apple Watch.









▲

FIGURE 69
Studies (mock-ups) to ensure the digital content converged with existing signage.

TYPOGRAPHY AS A SYSTEM FOR STORYTELLING IN DIGITAL MAPPING

As a typographic inquiry, this practice-based component was also an investigation into how a non-linear literary narrative could work as a geospatial storytelling experience. This was done by breaking up literary passages (gathered from the various sources listed in the *Type Trails* References) into single words, fragments of sentences and small paragraphs, exploring how these fragments converged with each other in the Mapbox software using its functions and affordances, and then how they converged with significant existing native plants, remnant or significant trees or signage in the physical environment to convey additional meaning. Literary fragments highlight the partial nature of cartography.

Placing the literary fragments or words on the digital map became an organisational principle. Working in the GIS software that I chose allowed me to layer information and to plot it, thus splitting the historical content geographically. "GIS is the generic name for software that allows users to locate data spatially" (Kurgan, 2013). In her 2014 article "Spatial media/tion", Agnieszka Leszczynski discusses how "locating" has become an organising principle of spatial media (Gordon & de Souza e Silva, 2011; Leszczynski, 2015). In her book *Close Up at a Distance: Mapping, Technology, and Politics,* Laura Kurgan states, "What GIS does well is to layer diverse sets of information into a single digital file or map". In my prototype, I layered the historical information onto the map, which then became geospatial data with longitudinal and latitudinal co-ordinates. I took advantage of this and placed a considerable amount of content into this map, demonstrating the potential for just how much more content could be formatted in this way.

> *Initially I placed too much emphasis on the genre and order, scale and hierarchy of the typographic treatment for the map and later needed to revisit what words I was using and the context of those words. The naming of the large trees that existed as forest in this area had been the titles in the prototype, it communicated very little to the viewer, making very little sense to an audience who were giving feedback in a formal feedback session. A professor present in the audience verbally critiqued this aspect and emphasised that in visual communication design, making explicit the attention to the language is the way that a purely language-based system works and is a key design component. That the language and words used can carry or kill a project.*
>
> *This feedback led me to think about what this title level of information could become so it communicated more of the intent and context of my research and became more inviting to the viewer. Following this, I changed the headline information to become fragments of larger paragraphs that described the landscape or flora, that include sensory information. They appear like "titles" or "title sequences" in the first stage of the map. (Journal documentation, 2 Feb 2021)*

I made the tools and styles in the mapping software that are usually reserved for naming and place naming to hold content that told a story. Sensory information was used on the first heading level, taking quotations on plant life and historical facts on the flora, then locating them and splitting these paragraphs into small sentences, and

sometimes into single words to create a sense of flowing through passages of text (aided by the kinetic affordances of the software). I structured some of the naming of the trees so that the digital map switches between names of the same flora, such that Indigenous names, Latin names, common names and original colonial names have all been made evident and the relationships between them explored.

As mentioned in the first chapter, this prototype is not intended to be scientifically or geographically accurate. In fact, such accuracy is not possible, as the historical data on pollen and geographic co-ordinates is fairly speculative, based as it is on the paucity of pollen readings in this urban area from old hand-drawn maps that lacked important geographic information and on tree growth patterns whose historical references are circumspect[46]. The result is rather a memory of a landscape, plotted over the actual one.

46 In the archaeological paper: "The Soil and Pollen Analysis of part of the Gardens of First Government House, Sydney" *Australian Historical Archaeology, 6,* 49–56., the authors state that 'Not only are undisturbed soil profiles extremely rare in the City of Sydney, but the existence of one sealed from later contamination must also be unique' (p. 51). Doug Benson and Jocelyn Howell in their 1990 book *Taken for Granted, the Bushland of Sydney and its Suburbs,* refer to the biodiversity in their map and research of this area as "likely vegetation" and comment that 'no details of the original vegetation have survived', they list what was likely to have grown in this area based on what 'the soils and topography indicate' (p. 42).

It was always my intent that this prototype contained not my own writing but work from a selection of authors, artists and poets, information from relevant government reports and physical signage in the area, so that it could become a system curated by others, and updated, changed or programmed to include other content and live data on trees.

Returning to the idea of how typography works structurally, central to this practice-based research was a question that author and theorist Johanna Drucker asked in her 2013 book *Diagrammatic Writing*, "How do structural relations participate in the production of meaning?" (Drucker, 2013, p. 87) which I explored previously in the way I analysed typography in street signage and in the creation of diagrams. I then started exploring how "structural relations" in the treatment of the typographical hierarchy might work in digital mapping software to structure storytelling and in this prototype, I used the hierarchies of scale and different levels of zoom to play with different layers of information in the storytelling. As mentioned, the first level acts like moving titles or headers. This level fades into the next tier of information which is experienced as fragments of sentences but when the user zooms in, it reveals larger paragraphs. I experimented with the degree of scale I could use to differentiate between the various levels of the information. Viewers of this work have mentioned that they dig down to find more, that the narrative builds over time and that they get lost in the text and the relationships between them, that there is an archaeological aspect, that the macro and micro bring a sense of digging away, or into, layers of history.

DESIGNING A VISUAL LANGUAGE

Pollen is used as an archaeological device, a dating mechanism and scientific system for determining foliage over many years and a way in which, in this area, scientists could determine which trees were growing before colonisation. It thus represents a way of moving back in time. In my early experiments I attempted to use pollen as a visual metaphor by using small type scattered across the map to reflect small particles of pollen in the air (figure 67). This did not translate in a formal feedback session; the idea was received well but the visual metaphor was not fully developed. Finding I could not resolve this, I moved on to the idea of *Type Trails*, which were influenced by the tracing of colonial maps. I used tiny sprinkled letterforms to trace

the outline of the adapted coastline as a visual strategy. The typography was initially largely abstract and aimed to be timeless through the way it was displayed on the screen in a fleeting and non-linear way. In the same way that the trees, wildflowers and stream were in this cove, and that some reminders of this still exist but much has disappeared, the words float and disappear.

The affordances of Mapbox allowed the letterforms to flicker, which was enhanced when the prototype was exhibited in the UTS Data Arena, which works through projectors. This made the letterforms appear to glimmer as well as flicker, which enhanced the concepts in this work. Different media will shift the meanings of the work and will need to be considered.

WHAT IS TYPE AS IMAGE?

"Type as image" is an industry term often used in magazine design. In an article in *eyeondesign* (2017) "Type as Image and Lettering as the Message: The Art of Magazine Typography", Emily Gosling quotes the designer and academic Neville Brody[47] "... realizing that typography was also about image-making: that was the breakthrough for me." (Gosling, 2017, para. 6). In her article she also quotes Brody discussing how typography as a tool can be effectively used to upset expectation, challenging the way text can be read in a certain context. Type as image is a technique used by visual communication designers to communicate a concept through typography alone (letterforms, words or paragraphs) that is read as an image, not just as type. It extends upon the experimental work pioneered by typographers such as Wolfgang Weingart and the work produced by Katherine McCoy at UCLA.

47 Neville Brody is a graphic designer and academic and was the Art Director of *Face* magazine from 1981 to 1986.

Through a process of experimenting with techniques such as mark-making (using print-making techniques, cutting up paper or digital letterforms, distorting letterforms via scanners, cameras or projectors, or using computer filters), through textural qualities (embedding texture into the letterform that could have been photographed from other materials and forms such as roads, metals or the materiality of signage); through playing with formal relationships or patterns (e.g., figure and ground relationships, repetition, hierarchy, scale, rhythm) or through digital materialities, distortions, effects and filters, the final image becomes viewed as an image in its own right, not just text, and it conveys a concept. Literary devices such as onomatopoeia or metaphors are often used visually to enhance a concept to play on visual/verbal relationships; therefore, the letterform or words are used as a visual poetic device. Sometimes the letterform or words are abstracted so that elements of the text are no longer legible but there is usually a hint of the word or letterform, so the concept is conveyed even though the word or letter is no longer necessary.

Type as image is often used in motion graphics, poster and magazine design. There are many visual communication designers whose careers have revolved around this approach to typography, pioneered by visual communication designers such as Vaughan Oliver, Paula Scher and Vince Frost.

In my practice-based research, I used this technique in air pollution experiments and I used it here by repeating letterforms to create another form, for example, the coastline, which also looks like a trail of tiny letterforms. I used this technique to

experiment with how letterforms and words can work with the zoom function and layers so that they appear to flicker, eliciting comments from viewers that it looks like a trail of city lights when viewed in the prototype and evokes constellations. It is not necessary for the viewer to see the content immediately as text. Viewers have also commented that because the trail of letterforms starts as abstract form that cannot be read, it invites the user to zoom in further to reveal what is legible.

Type Trails as a typographic system in digital mapping

Type Trails is designed as an adaptable system that can be used by others. The system is largely based on the typography being structured hierarchically through the different zoom levels in Mapbox and is a considered combination of typeface choice, paths of letterforms, typographic tracking and colour.

STORYTELLING THROUGH TRAILS: *Type Trails* follows three main memory lines as letterforms. As previously mentioned, I traced from old maps of Sydney the lines of the Tank Stream, the original coastline of Sydney Cove and the Aboriginal trade pathway of George Street. The storytelling unfolds out of these pathways and there are two main areas where the wildflowers are discussed. The trees are scattered over the whole area and located in *Type Trails* where they would have grown (see the *Type Trails* References for this part of the research). The trails could be adapted to suit another city or place.

THE HIERARCHICAL STRUCTURE THROUGH THE ZOOM LEVELS: *Type Trails* is structured in three or four levels, firstly as large titles, then sentences, then paragraphs as the viewer moves through the zoom levels into the content. The large eucalyptus green title sequences contain sensory information and pop up as soon as you enter the map.

TYPEFACE CHOICE: The typefaces in *Type Trails* were chosen first for legibility and second for context. In addition, the hierarchical structure of starting with a serif typeface in the larger title text and then using a sans serif for all the smaller text follows conventions in book and signage design. Therefore, the logic of the hierarchy remains familiar to the viewer.

TITLE LEVEL – DISPLAY FONT: The serif I have used in *Type Trails* was chosen first for its legibility on screen: it has a large x-height, a good weight for large and small sizes, the letterforms are distinctive and the modulation of the stroke is fairly even, which means thin strokes do not disappear into the blackness and affect the legibility. Second, it was chosen to fit a certain context: it looks like it could have come from the environment that the map covers. A material textural quality also occurs in Mapbox, in that on the larger text (that is, text set over a certain size), the edges of the letterforms have a rougher appearance and appear to deteriorate. Due to its even modulation and rounded serifs, this typeface has a chiselled appearance when used in Mapbox at this size, which references chiselled serif lettering in architecture.
The title serifs do appear at a lower level in a smaller size, which is used to repeat the sensory information at lower levels.

ADDITIONAL TEXT: The rest of the smaller text is all in a sans serif for legibility purposes. The particular sans serif chosen was designed by the same typeface designer and has been chosen as a good contrast to work with the title level typeface.

TRACKING: Tracking (the space between the letterforms in words) was used as a visual device to continue the concept of trails, so the viewer continues to move along the words. All words, apart from those in paragraphs, are tracked out (spaced out) so that the letterforms have a large amount of space in between.

COLOUR: The colours largely reference the visual language of map colours (blue for the water, green for the land). In the areas where I have placed information on the wild flowers, magenta is chosen for contrast. The colours chosen are enhanced (brightened) from map colours to suit a screen design with a black background, so they stand out well. The intensity of each colour was chosen to match the intensity of the white; thus the white does not dominate the hierarchy and the colour does not shift when the work is experienced on different screens. In other words, the colours do not change much when viewed on different screens or platforms. The eucalyptus green for the title level was chosen because of the prevalence of eucalyptus trees in this area.

WHAT PARTS OF THE SYSTEM COULD CHANGE WITH A CURATORIAL DECISION?
The system allows changes in typeface, colour and paths, depending on the specific use and location. In a different city or on different streets other layers could be introduced. A colleague mentioned that if it featured in Manchester, a layer on factories could be introduced. Similarly, the colour could shift if the Museum of Sydney were to use the system to tell a story about First Government House, and the choice of typeface and colour palette would be different again if the Royal Botanic Gardens Sydney used this system to tell a story about trees.

Viewers of the work have said that the serif typeface chosen has colonial overtones; I acknowledge that the typeface chosen could be interpreted as very European or colonial and that typefaces can be read culturally. However, many typefaces will fit this European context as typeface design of the roman alphabet is a European construct. The choice of typeface helps to link this map to 1788, which emphasises the enormous and devastating impact colonisation had on the Aboriginal people, the vegetation and the ecology. Keeping the content all typographic was a curatorial decision I made in order to analyse the texts I was placing into *Type Trails* and to look at how the pieces of information converged with each other. Part of the role of *Type Trails* is to provide a non-linear way of analysing literary content specific to a particular place. It made sense to keep the typeface "book-like" while referencing the environment as it then played into the idea that this was a text archive.

The conflict for me as a non-Indigenous designer was to address how the Aboriginal authors whom I incorporated into *Type Trails* should be correctly represented. If I removed their presence from *Type Trails*, I felt I was doing an injustice by portraying only one voice. I did not want to misrepresent views, but if I were to take this into an exhibition design or wayfinding experience post-PhD, I would seek Aboriginal guidance or a collaboration with an Aboriginal curator. There is the capacity to

incorporate the Indigenous voice via audio rather than in text, or to change the typeface for the Aboriginal authors but I would seek guidance on this.

AN INDIGENOUS VR IMMERSIVE EXPERIENCE OF THIS AREA

Brett Leavy is a Kooma man and VR artist who has created a 3D VR experience of the landscape, flora and fauna of this area in 1788, showing what the place would have looked like from an Indigenous perspective.

Using the affordances and restrictions of the digital mapping software

> *A conversation with the head of the Royal Botanical Garden's volunteer guides, Paul Nicholson, bought to my attention that an aerial GPS photographic map partnered with an updatable database on every tree in the botanical gardens, was, what he interpreted to be, the Royal Botanical Garden's best digital wayfinding system. This led me to thinking about GIS mapping as a format for investigating this idea of Type Trails as a system. (Journal documentation, 20 June 2019).*

> *Learning this new mapping software has made me aware of how digital maps rely on the zoom and scale function. This is limiting. The software of the mapping program limits the development. I am trying to manipulate within it (Journal documentation, 4 May 2019).*

In the initial stages of developing *Type Trails*, I considered this prototype as a form of bibliography, a place to locate the content I was working with, to show a sense of moving back in time through the dimensionality that zooming into a digital map provides. At one stage in the research process, I also considered it as a tool or mechanism for story-gathering to inform a wayfinding experience in the area. As I developed this further, it became a wayfinding experience in itself, through text, not just a device to locate storytelling. The flow of text started to be dictated by the story-telling of the paths of the Tank Stream, the wild flowers, the trees and the adapted coastline.

> *To attempt to create a digital materiality in this work I have utilised the affordances of the mapping software, large titles of interpretive ecological historical text appear in a fleeting manner on the screen on zoom or twist or turn utilising the smooth zoom transitions of the mapbox software. Small flickering letterforms appear in an abstract manner and in places form lines... tracing the lines of the invisible... memory lines... the line of George Street and the line of Tank Stream and the line of the original coastline – utilising the flickering effect that the software provides when small items are placed together on a very high zoom level. Larger titles of text flicker in and out and have to be read across the screen. Zooming in... letters interchange with words and the words can be followed like pathways down, up or across the screen. Zooming further... words give way to paragraphs of information by historical*

> *authors, council reports, cultural authors and from the content found in place, on signage within this environment. Text fleetingly moves in and out with the digital affordances of the touchscreen or mouse or touch pad (zoom, turn, isometric view). (Journal documentation, 16 Dec 2020).*

WHAT ARE THE AFFORDANCES AND THE LIMITATIONS?

Underpinning the process of making this prototype was an attempt to address how the affordances and limitations of the mapping software and of a location-aware device (primarily a touchscreen on a mobile phone) is experienced (Leszczynski, 2015). The limitations and restrictions of Mapbox determined how I structured the navigation of the reading. The affordances of the software–the fluid and fleeting transitions–contributed to the kinetic and temporal feel and the zoom function created the way I structured the changes in content and helped to integrate hierarchies of information.

In their 2012 book, *Digital Humanities*, Burdick et al. created a number of emerging methods for the digital humanities. One of these was "Augmented editions and fluid textuality". This is a method that is more relevant to archives and how digital environments can link up multiple copies of the same text. It also covers the ability of digital environments to use typographic conventions in interesting structural ways to analyse text (pp. 35–36). The digitality of the Mapbox software enabled me to work through a process of text analysis when locating content, first through splitting content into different zoom levels and second because the twist and turn function meant different paragraphs of text converged with each other in ways I couldn't always see happening when locating the text. It became evident after plotting content in this way that the affordances of the pinch and twist turned small paragraphs and words around kinetically and paragraphs that had been plotted together moved to sit beside other paragraphs in a way that I had not intended. As a result, I placed different authors next to each other to see how the various blocks of information would read when they moved around each other.

My prototype also creates a "fluid textuality" through its ability to engage with various bodies of text: "Texts are constantly flowed and reflowed, repurposed and reworked for different output streams and audiences." "We are witnessing a shift from the age of the individual voice to that of the collaborative, collective, and aggregated voice of the fluid text" (Burdick et al., 2012, p. 36).

I was asking the following questions: How temporal can I make this experience? What can I experiment with kinetically with the type? How can I do this within the restrictions of the Mapbox software? How much can I strip this away from looking like a "bird's eye view" cartographic map interface and make it an experience, a 3D experience? How might a typographic system work within a digital map to tell narrative? Therefore, I was exploring how I could digitally tell a story through a GIS map with typography, using only the functions of the Mapbox GIS mapping software. These become my set of restrictions. The information fragments become situated stories and geo-located content. They become data with longitudinal and latitudinal co-ordinates and a digital form of storytelling.

This prototype works with the fluidity of the software and I thought through the way we move our fingers to explore a digital map, which becomes the way text (that is, information) is either revealed or intersects. I also thought through how the layers could intertwine, how possible different dialogues or narratives could be viewed at once and how the restrictions and functions of the mapping software itself could be used to enhance this non-linear navigation. The making of this prototype made me think about how content was relating to other content, and how the restrictions of the mobile phone and the software were helping relationships in the text. As the user/viewer zooms in, more and more content is revealed, like searching beneath the concrete. In turn, different segments of information intersect; reading them brings up non-linear associations.

> *It is also making me question what type of content we can feed into online mapping and how this content can be viewed. I am not sure that I am trying to achieve being disruptive ie presenting an alternative form of mapping to hegemonic forms of mapping, or not. I need to determine what information I want people to take away. I need to decipher what this model of wayfinding design is doing that previous wayfinding design is not?*
> *(Journal documentation, 4 May 2019)*

Viewers of this prototype expressed their initial concern about not knowing what they were doing, but they began to gain an understanding of place and space and said that some of the text became points on the map. As they tried to make sense of *Type Trails* they started to make a story out of it and more and more was revealed. Importantly, wayfinding embodies "the possibility of getting lost, of losing oneself, of falling into and outside and away from known territories" (Holman & Harris, as cited in Rogers, 2021 p. 153). This sense of getting lost can open up a new state of being in the work. Viewers also described *Type Trails* as a story in space and that the blackness allowed the viewer to get lost and be immersed in the storytelling rather than just find one's way. I am not sure that I have been successful in disrupting the cartographic representation embedded in this networked geographical technology through exploring a wayfinding experience in this manner, or in balancing Western and Indigenous epistemologies. However, the experience of working through this has highlighted the ways in which digital wayfinding can contribute to working in this space. In seeking to answer the question "What does it add to the experience to add a digital component?" I would reply that it adds a time-based narrative that unfolds, it adds fluidity and a sense of temporality, it highlights sensory inputs in the environment from the past and it can make the invisible visible.

FIGURE 70
What digital wayfinding can bring to the field of wayfinding design. At the end of each investigation in this research I created a diagram to synthesise my process and as a tool of communication.

The point of differentiation in this work and emerging trajectories

I have identified three potential directions for this project to contribute to field of urban wayfinding design:

1 THE POTENTIAL OF THIS PROTOTYPE AS A TYPOGRAPHIC GEOSPATIAL STORYTELLING ARCHIVE

Digital storytelling offers the opportunity to layer information; often this is done in categories. This prototype layers the information fluidly and not in categories, working with the affordances and limitations of Mapbox. It works poetically, using typographic techniques such as text as image and follows trails of letterforms that follow existing paths. The fluidity of the navigational logic echoes past text-based explorations in interface design. However, it is different in being location-based, using the tracing of invisible paths in the research area as a pathway guide, albeit within the affordances and limitations of Mapbox. It examines the capacity of a GIS mapping software interface to be used as a geospatial typographic storytelling device that

could potentially operate as a text archive and as a wayfinding experience at the same time. It could be expanded further from an archival research point of view to split and display only certain texts and narratives, and to work with live data.

2 A GENEROUS WAY OF WORKING WITH CONTENT

Type Trails is a generous way of working as it taps into and feeds into what storytelling content already exists in this environment and at the same time invites content in through the many layers of literary sources. I have attempted to avoid creating a "grand narrative" (Farmen, 2016) in this prototype by including Indigenous and non-Indigenous authors who critically investigate the ecological history of this area, information from pollen readings that contain historical data, from colonial botanical journals, from existing physical signage in place, from the botanical gardens and from ecological government reports. This is a suggested non-linear system for a way to include a diverse range of literary sources, represented through an interface and a typographic style that aim to represent these viewed graphically, but accurately.

3 THE POTENTIAL OF DIMENSIONALITY AND SCALABILITY

There is an inferred horizontal and vertical infinity which is a result of working with the affordances of the digital mapping software and is enhanced by the structure of the typographic content. Viewers of the work have commented that vertically it gives the feeling that you can dig down to every tree root. Like fractal theory, the length of the coastline seems so much larger at the inner zoom level.

Type Trails was built as a base, not an end-point, and it has potential for scalability. When I placed this in front of peers who work with Mapbox, they immediately read it as an archive, while a peer from a different discipline saw the potential for it to be globalised.

WHAT I WANT PEOPLE TO FIND OR KNOW THROUGH THIS EXPERIENCE

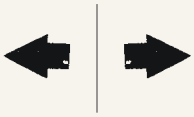
From a feedback session with academic peers in the Design School at UTS, when the prototype became a talking point for the stories of lost streams in cities, I realised *Type Trails* also had the potential to open up conversations on the public memory of lost streams and the "way we know cities" (Kurgan, 2020). The stories of lost environments in cities have captured public imagination. Grace Karskens (2009) mentions Sydney Living Museums in collaboration with Sydney Water run a raffle each year for a tour of the Tank Stream. The winner is taken into underground tunnels and can see where the Tank Stream (now a floodwater) currently flows (Karskens, 2009, p.542). Tank Stream Way and Pitt Street run above it and sections of it would have run through where current buildings between Pitt Street and George Street are now situated. Grace Karskens (2009) also mentions that a public initiative in 2007 to bring back the Tank Stream was written about in the Sydney Morning Herald, and that Tank Stream has not been lost to public memory (2009, p. 542).

CHAPTER 7

Conclusion

CONTEXTUAL REVIEW & SURVEY

AN INVESTIGATION OF WHAT IS



RE-IMAGINING URBAN WAYFINDING

PRACTICE SHOWING WHAT COULD BE ...

CONCLUSION

Urban wayfinding design has been a field largely focused on a problem-solving process; this practice-based enquiry puts forward an alternative in the form of a storytelling-based approach. This research also contributes to a dialogue on how digital wayfinding and navigational technologies are producing new methods to navigate and experience cities and are redefining the role of wayfinding design. It has also looked to an alternative theoretical base than that of cognitive mapping in order to focus on finding the "hidden logic" (Gibson, 2009, p. 44) of how we find our way around a city through its ecological, cultural and historical information. This has been informed by the theoretical ecological approach to wayfinding of Harry Heft (1996, 2013), the wayfinding definitions of Tim Ingold (2000) and the guidelines developed by the NSW Government Architect on *Designing with Country* and *Connecting with Country* (2020b, 2020a).

A criticism from within wayfinding design practice

The "what is currently in place" contextual survey (see Chapter 4) identified that there were wayfinding systems in the Sydney city centre area of my research based on connectivity, accessibility and legibility. It also identified the disjunct between the ecological history of the area and contemporary digital wayfinding and physical signage.

Type Trails aims to provoke a dialogue about the current ecology of this urban area by means of a locative immersive digital wayfinding experience through the historical ecology and environment of the wildflowers, the lost stream, the original trees, the original Aboriginal pathway of trade and adapted coastline. In this context, the prototype becomes a discursive object that I could take to city, wayfinding design or mapping conferences. It could equally be used to discuss the possibilities of geospatial explorations using typography as a storytelling device in digital mapping.

The first significance of this research is how this prototype can be used as a discursive object to start conversations with people about orientating and wayfinding in this area, which opens up conversations around historic aspects such as lost streams or endangered ecologies. I have started to do this by integrating this prototype into my teaching.

The second significance of this research is as a geospatial experience in type; it puts forward a variation on storytelling through digital mapping, different ways of receiving information based on a geolocated mapping experience. *Type Trails* could also be used to talk through the potential of text-based narratives in this format, not only as a system for storytelling but also as a text archive.

The contribution to knowledge therefore includes ways of:

- structuring typographic storytelling layers in digital mapping in a fluid manner so that they can converge and present a diverse set of narratives
- using the dimensionality and scalability of the zoom functions of digital mapping software as a typographic system for storytelling which could be used as a text archive or as digital wayfinding
- providing a non-linear and generous way of working with content so that many literary sources can be included as an alternative to layering information in categories.

It also contributes to a body of knowledge on how storytelling can converge more seamlessly with digital wayfinding and physical signage.

In this research, I used an RTD methodology explored through a critical documentation process. Ramia Mazé's modes of criticality in design practice (2009) were important here in defining my contribution to the field of wayfinding design research [45]. The first mode that Mazé discusses and that I adopted is that I critique my own practice in order to develop my work through a reflective inquiry. I shifted my wayfinding design practice into a research-based practice with a greater understanding of how the tools of my own visual communication design background could become devices for critical inquiry into existing wayfinding design and systems and that I could produce prototypes that critically probed the principles of wayfinding design.

The second mode that Ramia Mazé discusses and that I adopted was to critique my own discipline to extend it or build a disciplinary discourse (Mazé, 2009, p. 391) into what urban wayfinding design can become. Through this research I have demonstrated that for city wayfinding systems to enhance the experience of walking and orientating, wayfinding design could use a storytelling approach that focuses on the cultural and ecological history of the area. This could also critically probe its existing systems and produce wayfinding design prototypes for what could be.

The third mode was to look outside my own discipline and use design practice to critique "pressing issues in society" (Mazé, 2009, p. 395). Through this research I have produced a prototype that speaks to the world and asks people to consider orientating and wayfinding through ecological information in order to relate to place. As a dialogue on wayfinding design, it asks others to think about how we orient ourselves in a city and how we use storytelling that respond to greater cultural and ecological conversations about endangered vegetation and lost streams in Sydney.

The potential for digital wayfinding to enable new ways of experiencing place

This research points towards the potential for digital wayfinding to enable new ways of experiencing place different from those experiences expected of digital mapping. The criteria prioritised in most digital mapping and wayfindng systems demands quick and practical goal acquisition and focuses largely on a search approach (Pitt & Sterling, 2020) to 'finding a way from a place to one or more destinations and perhaps back to the original place' (Mollerup, 2005, p. 27), on locating and instantly connecting the user/traveller to the nearest amenities, transport, and local economy. This approach only speaks to the 'strider' [48].

48 Per Mollerup argues that there are two types of travellers, those who like to be directed and those who like to find their way around a city. Similar to this, during the Legible London project, two distinct personae were created that were coined as the "strider" and the "stroller". See page 41.

By considering what the 'stroller' [48] seeks, *Type Trails* offers a richer orientation to place, one of engaging with the journey of wayfinding and the cultures and ecology of place, of exploring what is and what was and of learning through storytelling. The result is a memory of a landscape, plotted over the actual one. The wayfinding experience of *Type Trails* involves getting lost and being immersed in this state and then re-finding the way "The possibility of getting lost, of losing oneself, of falling into and outside and away from known territories" (Holman & Harris, as cited in Rogers, 2021 p. 153). This sense of getting lost can open up a new state of being in the work.

Potential directions

TYPE TRAILS COULD POTENTIALLY BECOME A NUMBER OF PROJECTS:

I have taken the prototype to a point at which some aspects are still imagined. It could be developed further in post-doctoral research to produce an immersive experience as:

- A fully-functioning location-based wayfinding experience on a mobile phone as a mobile storytelling experience, in combination with a marker-based design in the environment to trigger the app or website. There are already environmental graphics in place in this area for the adapted coastline and the Tank Stream along the Pitt Street Mall. There are also different types of signage in this area that converge with the literary information in the prototype. This experience could additionally have environmental design markers in the area that trigger or converge with the digital experience.
- Virtually, it could be worked into a large-scale, large-screen exhibition piece that uses touchscreens and it could even work on a table in an exhibition setting. There is also potential for sound to accompany the work. Ultimately, I would like to add sounds of the forest, the stream and the shoreline, so that when the user moves the screen into these positions, they hear these sounds. This becomes a big undertaking that would require collaboration with sound artists and/or sound researchers and would require funding for a potential extension of any project-based post-doctoral research. It also has the potential to be motion-sensor based, so that the viewer's movement itself triggers the map to zoom or move.
- *Type Trails* could also be an experiential tool for talking to people in industry, at conferences or at design festivals, to open up conversations on the

storytelling of this area. It could become a talking point on the stories of cities, on the way we know cities, on what lies underneath cities, such as lost streams. It could reveal the beginnings of city plans and wayfinding, the invisible underlying landscape features and the cultural and historical past that shaped the current wayfinding and orientation of this area.

If I had a grant to develop it, I could keep expanding it out to Greater Sydney, or even Australia. It is fairly endless therefore how far I could take the project: dimensionality is a key part of how this is intended to work.

POSSIBILITIES FOR FURTHER COLLABORATION

In my professional practice, I have been part of a collaborative team on a project for the City of Sydney working on an Indigenous interpretation strategy and implementation of an interpretive design work *Marray (Wet)* (see Appendix) for Gunyama Park, a new aquatic centre and recreational facility in the centre of Sydney. This has been led by Danièle Hromek and involved a collaboration between myself, Annabel Stevens[49] and Isabelle Toland[50]. This project has also been informed by elder Uncle Greg Simms[51] and was instigated and guided by David Beaumont[52]. There was an additional collaboration with the company IndigiGrow[53] at the launch. The interpretation looked at ways of embedding local language and interpreting local Indigenous cultural storytelling into the centre, at strategies for growing native plants to attract local fauna and communicate the local seasons, at ways to communicate this knowledge to staff at the centre and to the general public through signage, digital experiential design and planting. The strategy document will be used as a model for further City of Sydney projects. I prefer to contribute to this area of cultural storytelling in wayfinding post-PhD under the guidance of Indigenous-led research projects and in collaboration with other Indigenous designers, ecologists and knowledge holders.

49 Annabel Stevens is a director and founder at axinteractive.

50 Isabelle Toland is a partner at Aileen Sage Architects

51 Elder Uncle Greg Simms descends from the Gundungurra (water dragon lizard people) of the Blue Mountains and the Gadigal (whale people) of the Dharug nation, as well the Budawang (beach plover people) of the Yuin nation.

52 David Beaumont is a Wiradjuri man born on Gadigal lands and Senior Community Engagement Coordinator, Aboriginal Community Development, City of Sydney

53 IndigiGrow is a nursery and environmental and cultural education company specialising in native plants, bush food and reviving the eastern banksia scrub in Sydney (which is one of Sydney's critically endangered vegetations). https://www.indigigrow.com.au/

POSSIBILITIES FOR FURTHER RESEARCH

- To continue to research and push boundaries on a storytelling approach to wayfinding systems, to identify what systems could tell more of a story and be incorporated through digital wayfinding and physical signage in interesting and non-linear ways, to explore ways in which to push this into other contexts, perhaps into hospitals, parklands or national parks.
- To look at the pathways of non-humans (flora and fauna) in cities and incorporate them in the storytelling, in relation to pedestrian wayfinding.
- To contribute to ways in which storytelling can converge more seamlessly with digital wayfinding and physical signage.
- To continue to re-define the role of wayfinding for a Sydney context through collaborative work and to think about wider opportunities.
- To look for grant opportunities once this is complete. In February 2020 Australian Marine Parks was offering large grants for interpretive digital signage that explored storytelling; this is the type of area to which I would like to contribute.

EPILOGUE

An aspect I have struggled with on the journey of this research has been how to work respectfully with elements of Indigenous storytelling or stories about Gadigal Country when this research is situated on Country.

As I am a non-Indigenous person, my experience of working on projects in which Indigenous stories were explored visually through a wayfinding experience and guided by Aboriginal experts, namely, David Beaumont, Danièle Hromek, David Key[54], Aeisha Saunders and Leanne Watson[55], has been invaluable to my understanding of the need to be extremely respectful and careful about how these stories are handled, portrayed and visualised. This and the experience of concurrently working on the Indigenous Interpretation Strategy for Gunyama Park Aquatic and Recreational Centre (GPARC), under the leadership of Danièle Hromek and the guidance of David Beaumont and in collaboration with Annabel Stevens and Isabelle Toland, has made me see the importance of ensuring that any stories or knowledge that are shared are done so in a culturally safe way, that the intellectual property is respected and that the stories are not appropriated. I have endeavoured to follow the guidance of the Australian Indigenous Design Charter – Communication Design AIDC–CD.

54 David Key (Darug/ Dharawal) is the Visitor Services Coordinator at Rouse Hill Estate, Sydney Living Museums

55 Leanne Watson is a Darug woman and artist, researcher, educator and Chair of the Darug Custodian Aboriginal Corporation.

My concern is that I have found it easy to "crave" or want to "work with", "share", "be part of" and therefore "take" the stories of Country, as they hold so much knowledge and understanding of this place that we can all learn from. I have alarmed myself at stages of this research when I identified that I craved to use stories that were not culturally mine to share. I feel I have learnt to understand the consequences of these actions and I have learnt to be guided, to listen and to learn.

What this experience of working in this space has taught me is that I will make mistakes along the way, but if I recognise them, I can rectify them.

My sincere hope is that I have not overstepped any cultural understanding in this research, that I have claimed only the storytelling that is publicly available and has been gifted to be shared. I have taken many steps to ensure this.

The intention of this research is to open up dialogue that our wayfinding systems need to be reconsidered, discussed, researched and reinvented to incorporate Indigenous wayfinding knowledge in this area through a collaborative, Indigenous-led approach.

APPENDIX

Marray (Wet) is an Indigenous-led interpretive design work at Gunyama Park Aquatic and Recreation Centre (GPARC) in Sydney (see Figure 71). It is part of the outcome from the *Indigenous Interpretation Strategy for Gunyama Park Aquatic and Recreation Centre*, and was designed as a semi-permanent installation to coincide with the Centre's launch on the 27th of February, 2021. Words from the local Aboriginal languages that originate from Country are revealed by water, words reflecting that the Country of Gunyama is a watery place. The work is a collaboration between cultural designer, Danièle Hromek, myself, Annabel Stevens, Isabelle Toland and Fauzima Rafiq. (Read more information on this project on pg 157).

FIGURE 71 ▶
Photographs of *Marray (Wet)*.

Photo: Danièle Hromek

Photo: Danièle Hromek

Photo: Danièle Hromek

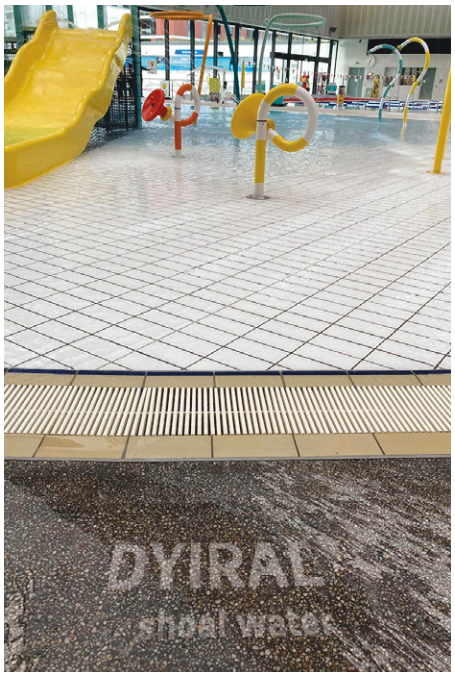


Photo: Danièle Hromek

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