Green Promises, Grey Realities: The Politics of Park Provision in Sydney

by Megan Kate Taylor

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Certificate of Original Authorship

I, Megan Kate Taylor, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Design, Architecture and Building, School of Built Environment, 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.

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Preface

It is only fitting that the first to speak about these lands, skies and waterways should be an Aboriginal Elder. My humility and respect to Aunty Rhonda Dixon-Grovenor for allowing me to begin my work with her words as the foundation.

To understand the experiences of First Nations Peoples and the impact of colonisation, one needs to come from the recognition of First Nations political history and respect for our cultural practices that sustain Earth. These align with our ongoing resurgence for transformation. I come from a strong family of Aboriginal activists and strong women who have been leaders in the family. As a Grandmother, I have 14 grandchildren to be inspired by and who push me forward to be engulfed in my culture and Country.

…

When research is done in the proper way, the research transforms to renewal. When following protocols and ceremonies using sacred ceremonial words that have been used and passed down for over 80,000 years, this is when you feel the healing power of the land and spirit.

…

With ongoing colonisation and state violence, it is so vital for me and the First Nations traditional descendants of the Sydney Saltwater Basin to reconnect to Country – to perform Ceremony, follow protocols and reconnect to songlines, culture, art, and dance. As Saltwater people, we need to collect and correctly prepare our bush medicines and use the languages of bush food, medicines, wood and ochres. Access to Country is vital to the continuation of Indigenous peoples' culture, it is belonging, it is connection. Without connection to your Country, your Homeland, it becomes difficult to learn about your medicines, your environment and how it connects to seasons and food. We have kept our culture alive by accessing the small pockets of bushland in and around Sydney. The importance of land for intergenerational teaching of Indigenous knowledge is deeply connected to the seasons and to Saltwater Peoples united resurgence moving forward (Dixon-Grovenor, 2023).

Thank you to Professor Jason De Santolo for keeping me grounded and introducing me to Aunty Rhonda. Aunty, thank you for your reassuring presence, wisdom and service.

I wish to acknowledge and pay respect to Aboriginal Peoples past and present as the traditional owners of the land on which I conducted this research; the Gadigal people of the Eora Nation, on whose ancestral lands the University of Technology Sydney City Campus is situated. I also wish to acknowledge the Aboriginal Community as the traditional and original owners, and continuing custodians of the land on which I focused my case study (Sydney). As Aboriginal and Torres Strait Islander Peoples continue their struggle for equality and justice in a land that was stolen from them, I acknowledge several of the central themes of this thesis, identified as local knowledge, community, land management and geography, have been important for and practised by Aboriginal and Torres Strait Islander Peoples on this land for 80,000 years before I began my thinking and writing on the topic, and so shall they be into the future.

Note: when Crown Lands are referred to throughout this thesis, either explicitly or implicitly, the author acknowledges these as unceded sovereign territory and acknowledges the true custodians of the land are the Aboriginal and Torres Strait Islander Peoples to which they are connected.

Taking my cue from the words of Auntie Rhonda above and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), the term Aboriginal Peoples is used within this research in respect to First Nations Peoples' mainland Australian histories, sites, connection to and caring for Country, and identity (AIATSIS, 2022). Aboriginal and Torres Strait Islander Peoples may identify differently to the language I have chosen in this research. Language too can change over time, and I can only hope, that my use of current terminology does not cause offence to current or future generations.

At the time of writing (May 2024), the term "First Peoples" was used in NSW Government policy documents, industry and in the modern Australian based lexicon as a collective reference to Aboriginal and Torres Strait Islander Peoples. Across the academic literature cited, the term "Indigenous" is frequently used. Which is why "Indigenous" was used in the primary data collection tools of this research. When scholars have identified as being of Aboriginal or Torres Strait Islander descent,

where possible the language used within their research is followed. Any mistakes or omissions in regard to this matter are my own.

Aboriginal and Torres Strait Islander Peoples should be aware that this thesis may contain names of people who have passed away.

Abstract

This doctoral research investigates the provision of parks in Sydney, Australia, amid shifting urban density and land uses. As the city intensifies through both brownfield and greenfield development, the ability of planning systems to deliver accessible, functional open space is under increasing strain. Despite the growing policy emphasis on liveability and urban greening, little is understood about how state and local governments navigate the complex decision-making environments that shape new park provision.

Using a qualitative methodology — comprising a pilot, a two-round Delphi study, and semi-structured interviews with 17 state and local government planners — this thesis explores the institutional, structural, and funding mechanisms that underpin park delivery across a constrained regulatory context. The research identifies six critical elements for effective delivery of open space provision: funding, land availability, community input, open space standards, scalable frameworks, and innovation.

This research contributes original empirical evidence and a nuanced understanding of the tensions between land value, policy ambition, and urban equity. It advances planning theory by illustrating how spatial models of urban intensification intersect with governance structures and community expectations around access to nature. Ultimately, it argues that stronger cross-sector collaboration and adaptable planning frameworks are essential to ensure that park systems remain inclusive, connected, and resilient in the face of urban transformation. This is essential if cities and city-dwellers are to remain healthy, sustainable and adaptive into the future.

Acknowledgements

Professional

To my supervisors, Emerita Professor Heather MacDonald, Professor Phillippa Carnemolla and Dr Shanaka Herath – you are academic unicorns. You have changed my life!

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Shanaka, there would not be the same depth to my work if it were not for you. You encouraged me to push the logistical boundaries to their limit, and when that failed you provided me the means and confidence to start again, yet still incorporate enough of the skills and methodologies I originally wanted so that I could live with this document. Because of you, I am a more well-rounded and informed researcher.

To the professional staff across the university whose paths have crossed mine, thank you for making my life easier and helping me navigate the administrative burdens of a PhD. To Annalise Hegyessy, Anna Richter and Tiger Gill-Finnegan, I know I am chaos, but it is a good kind of chaos, right? Thank you for your time, resources and creativity. To David Litting, my favourite librarian, without your speed, skill and support, this thesis would not be nearly as interesting or my knowledge so wide. Thank you for indulging my document shopping whims and tracking down the

obscure and the inaccessible articles I requested. There were days where your gentle nature and supreme efficiency were the only things that got me through. To the academics across the School of Built Environment who took the time to read and review earlier versions of my work, thank you. Your contributions were invaluable. To everyone else who has taken an interest in my research along the way, I extend my gratitude.

To the DAB PhD girls et al., thank you for making those early years so magical and full of fun. From Friday afternoon pizza, secret Saturday cake, and the bonds that come from shared experience and untangling methodologies, I appreciate it all. To Georgina Donaven, Eva Garcia, Catherine McGrath and Dr Stella Tan, thank you for making the slog of the last years manageable. Sharing a corridor and becoming friends has been a lovely surprise. We are going to need a new spot for wine and cheese.

To every other PhD candidate out there wondering if you will get through this; the answer is a resounding yes! Just keep going!

Thanks to professional editor, Hazel Baker, who provided copyediting services according to the IPEd guidelines for editing research theses. Any remaining errors are my own.

Personal

Life is about people and not the accumulation of things, but sometimes the interplay between those relationships overlaps. In this instance, I cannot go any further without acknowledging the objects and kindness behind those that literally made this PhD possible. Firstly, to the coffee machine I bought my husband for his birthday (stroke of genius) and the fuchsia pink beanbag he bought me for mine. The relaxing chair from my mother that follows the sun around the garden like a sunflower, the extraordinary amount of Lego that keeps our daughter endlessly engaged in her own urban planning pursuits, and the repurposed laptop from a friend on which I write.

To Dr Karena Viglianti-Northway, thank you for your encouragement, clarity of thought, and mentorship throughout this PhD. You were right; I do feel better now the thesis is finished. Your quick mind, dry humour and fierce approach to life has taught me so much about myself and who I want to be. Thank you for everything. Holiday? To Dr Lisa Stafford, I am so glad we met. Thank you for your guidance and friendship over the last few years. To John Smartt, you are gentility and support personified. To Che Winters, you are amazing. To everyone else who cheered from the sidelines and understood when I disappeared into my work for months on end, thank you. Lastly, to Rod and Annie Seymour my thankfulness for your practical intervention in our lives is greater than you will ever know.

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Table 1
General abbreviations

Abbreviations	Full phrase
ANZSCO	Australian and New Zealand Standard Classification of Occupations
CBD	Central Business District
CVD	Colour Vision Deficiency
DRD	Developmental Reading Deficiencies
GCCSA	Greater Capital City Statistical Area
GDP	Gross Domestic Product
GIS	Geographical Information System
Gov	Government
HA	Hectares
IP&R	Integrated Planning and Reporting
JO	Joint Organisations
KM	Kilometres
LEP	Local Environmental Plans
LGA	Local Government Area
LSPS	Local Strategic Planning Statements
NSW	New South Wales
RDMP	Research Data Management Plan
REP	Regional Environmental Plans
SEPP	State Environmental Planning Policies
SGA	State Government Agency
SUA	Significant Urban Area
UK	United Kingdom
USA	United States of America
VPA	Voluntary Planning Agreements
Vs	Versus
WCAG	Web Content Accessibility Guidelines
WSCD	Western Sydney City Deal

Source: Author.

Table 2
Organisation abbreviations

Abbreviations	Full phrase
ABS	Australian Bureau of Statistics
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
APA	American Psychological Association
APH	Australian Parliament House
AURIN	Australian Urban Research Infrastructure Network
CFS	Committee for Sydney
DCS	Department of Customer Service
DE NSW	Department of Education New South Wales
DIRDC	Department of Infrastructure, Transport, Regional Development, Communications and the Arts
DPC	Department of Premier and Cabinet
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Department of Planning, Industry and Environment
EPA	Environmental Protection Authority
GA	Government Architect
GCC	Greater Cities Commission
GSC	Greater Sydney Commission
IPC	Independent Planning Commission
IPEd	Institute of Professional Editors
LG NSW	Local Government New South Wales
LGPA	Local Government Professionals Australia
OLG	Office of Local Government
RMS	Roads and Maritime Services
SDSN	Sustainable Development Solutions Network
SINSW	School Infrastructure New South Wales
TfNSW	Transport for NSW
UN	United Nations
UN DESA	United Nations, Department of Economic and Social Affairs

Abbreviations	Full phrase
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UN-Habitat	United Nations Habitat
UTS	University of Technology Sydney
WHO	World Health Organisation
WHOE	World Health Organisation Europe
W3C	World Wide Web Consortium

Source: Author.

Table description: Table 1 and Table 2 list general and organisation abbreviations used throughout this thesis. Abbreviations are listed in alphabetical order for each table. Table 1 has 2 columns and 28 rows, and Table 2 has 2 columns and 35 rows, including the header rows. In both Table 1 and Table 2, the first column heading = Abbreviations and the second column heading = Full phrase.

Chapter 1: Introduction

1.1 Premise of the research

Parks provide enormous public benefits for urban environments. It is therefore important to understand the role of parks in the human habitat and in the biodiversity of an urban environment. This is because if the policies administered and the decision-making environments used to put those policies in place do not meet scalable expectations, city dwellers will end up with a city/region that does not function. This is important because as urbanisation increases and cities densify, there is an increasing loss of greenspace provision, resulting in parks carrying even more of the natural and human-made burdens but with fewer resources (Hansen et al., 2019). Haaland and van Den Bosch (2015) find that one of the commonalities across densifying cities globally regarding the loss of private greenspace provision is that the densification is rarely offset with adequate open space. Paradoxically, greenspace and green infrastructure are being heralded as an essential means of future-proofing the urban environment, yet are likely to be difficult to implement in practice owing to various other urban demands and resourcing priorities (Dobson, 2021, 2022; Nieuwenhuijsen, 2021).

This thesis focuses on local park provision, because it is essential to Sydney, or any city's productivity, sustainability, health and function. Local parks are recognised as a crucial feature to the urban environment (DPE NSW, 2023; Ellis & Schwartz, 2016; GSC, 2018b; Konijnendijk et al., 2013). Given the constraints, policies and processes of government entities, parks are constantly being weighed up against other priorities, demands for resources and means of implementation (Boulton et al., 2018; Corkery & Marshall, 2018; Infrastructure Australia, 2019). Urban environments are highly competitive commodifiable resources, particularly where land zone usage is concerned. Cities require infrastructure, all forms of which compete for limited land supply, government funding and prioritisation. Peschardt et al. (2016) argue that while research regarding parks is gaining momentum, more research is required for stakeholders to make more insightful planning and policy decisions regarding the best use and placement of parks for maximum efficiency and multi-functionality.

How much greenspace provision is enough is a common question posed by scholars across the literature and there is no easy answer (J. Byrne & Sipe, 2010; Corkery & Marshall, 2018; Haaland & van Den Bosch, 2015; Kabisch et al., 2016). Hooper et al. (2018) posit there are three questions that continue to plague planners: 1) How much open space needs to be provided? 2) What kind of open space needs to be provided? 3) Where should the open space be located? Similar questions have been asked by Y. Hsu et al. (2022) as planners and scholars alike grapple with the complexities of greenspace provision, city growth, social benefit, community demand and the constraints of policy, funding and land supply.

The value and use of parks in communities both domestically and internationally are undergoing significant changes, influenced by shifting community expectations that were likely accelerated by the disruption of COVID-19 (Astell-Burt & Feng, 2021; Berdejo-Espinola et al., 2021; Feng & Astell-Burt, 2022; Mell & Whitten, 2021). There is limited knowledge about the policy and structural mechanisms available to government entities in Australia to effectively respond to these changes in demand for park provision (Boulton et al., 2018; Bush, 2020; J. Byrne & Sipe, 2010).

Using Sydney as a case study, this thesis helps deepen the understanding of park provision in a multi-tiered democracy and establishes six key elements required to ensure park provision remains sustainable, adaptable and implementable in a rapidly changing city/region. These six key elements fit into the following groupings: 1) funding; 2) land availability; 3) community expectations and engagement; 4) open space standards; 5) policy priorities and objectives; 6) park innovation. These six key elements form the basis for the recommendations of this research that extend beyond the immediate applicability of the case study and will be of value to other stakeholders in other jurisdictions both domestically and internationally that, like Sydney, are experiencing rapid urbanisation.

Environments are changing and natural resources such as parks are coming to the forefront of sustainability efforts as a value-add to the quality of civilisation. This is important as we look to the future and plan for ever denser cityscapes (Browning et al., 2022; J. Byrne et al., 2010; Haaland & van Den Bosch, 2015; Richards et al., 2017), preparing for a greater population living in urban centres and anticipating the health and wellbeing considerations that will be required (Ambrey & Fleming, 2014; Kent & Thompson, 2014; Nieuwenhuijsen, 2021). Increasingly, how public space is

planned, by whom and for what ends will require greater consideration as resources become more finite. One area that is emerging out of these themes is that of urban health and wellbeing, the inclusion of which scholars argue would create a more holistic approach to urban form (Kent & Thompson, 2014).

This research does not directly address the topics of urban health or public health outcomes, or those of climate adaptation for example, but it does recognise the consequences of open space provision as a contributing factor to such urban planning discourse and debates, and the practical implications of these. This research therefore adds value to these broader areas by using Sydney as a case study to further enable the understanding of the barriers and enablers of decision environments, and the delivery of open space provision as an essential resource in a constrained regulatory context where competition for resources, and by extension their rights to implementation, is intensifying.

This thesis builds upon the work of scholars representing various aspects of open space provision, directly and indirectly, and from various perspectives, who call for further research so that government supply mechanisms and the ability to influence park provision are better understood (Boulton et al., 2018, 2021; Bush, 2020; Corkery & Marshall, 2018; Lin, Thompson et al., 2023; Lowe et al., 2020; Torabi et al., 2020). Boulton, Dedekorkut-Howes and J. Byrne, who frequently examine park provision from a local government perspective (Boulton et al., 2018, 2019, 2021, 2022), with other scholars, repeatedly suggest that more research is required to understand park provision processes and challenges from a local government-based perspective.

Boulton et al. (2019) further suggest that planners from local councils should be consulted ahead of other stakeholders – such as politicians, developers or the community – due to their position at the intersection of planning, public policy, governance, decision-making, implementation and stakeholder feedback processes. They reason that planners are uniquely placed to identify the policy and structural mechanisms influencing park provision. Boulton et al. (2021) further note that one of the challenges in understanding open space from a supply mechanism perspective is the reluctance of planners to speak out about the barriers and constraints faced by their profession for fear of compromising job security or future prospects, which may

explain why the perspectives of planners across the literature are relatively scarce compared to other groups.

This research further informs a broader body of scholarship on planning governance, policy processes and city-shaping discourse. The study conclusions contribute to wider practices of urban planning, funding, advocating, and delivering infrastructure for healthy, equitable and sustainable cities. The results and recommendations of this case study highlight the need for a more synthesised, flexible and appropriately valued approach to all elements of park provision.

1.2 Research focus and approach

The following section outlines the scope and approach used to conduct this research. It examines the research questions, provides an overview of the research methodology, describes how data was collected and analysed, and discusses the presentation of this thesis; the full details of which are provided in Chapter 3[1].

1.2.1 Research questions

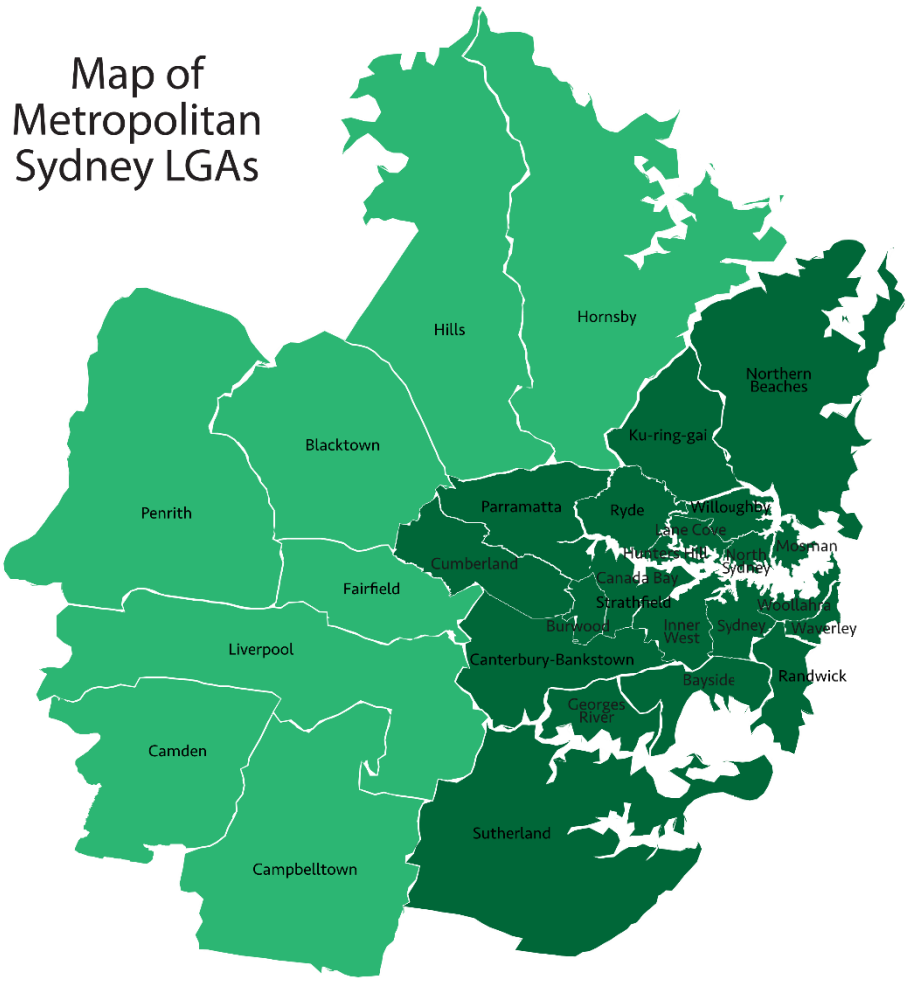
Three overarching questions have guided this work:

1. What are the crucial elements needed for new park provision and how do perception and availability of these elements differ among state and local-level policy-making entities and among individuals working with those entities?
2. Do some localities experience sharper deficits and, if so, what can be done to address local disadvantage? How would park provision strategies need to be revised?
3. How could deficits be overcome? What strategies have state and local entities developed to increase park provision? Is there any consensus about the effectiveness of strategies among policy actors at different levels?

The focus of this research was on the policy, structures and funding shaping park provision in NSW, Australia, using the significant urban area (SUA) of Sydney, NSW, Australia (ABS, 2021b) (also referred to in this document as Sydney or Metropolitan Sydney, further defined in the Definitions section below) as the case

study. It explored how and why park provision outcomes differ across brownfield and greenfield local government areas (LGAs) in Sydney. A brownfield area is an area that has previously been developed for residential or other urban purposes, such as the established suburbs of Sydney. These are also referred to in this thesis as redeveloping areas, as they are frequently earmarked for infill development. A greenfield area is an area that is yet to be developed, or that is comparatively undeveloped for residential or other urban purposes. The terms brownfield and greyfield are interchanged across the literature, as are their definitions. They can either refer to a redeveloped residential site or redeveloped industrial site (D. Adams et al., 2010; Newton, 2010; Newton et al., 2012). When referring to brownfield and greenfield areas, this research is partially guided by the definition of infill and greenfield development areas in Sydney proposed by Biddle et al. (2006) in their literature review examining the costs of infill development against greenfield development. This is to say, residential brownfield areas are redeveloping areas which may include areas previously utilised for either residential purposes or industrial sites[2], but are unlikely to include large grey infrastructure such as airports or large ports. Sydney suburbs that are closer to the coastline are more established compared to Western Sydney, where greenfield areas predominate.

Figure 1
Map of Metropolitan Sydney LGAs by brownfield and greenfield areas



Source: Author.

Figure description: Figure 1 shows a map of Metropolitan Sydney LGAs. The map is overlaid using one administrative boundary, LGA boundaries, the borders of which are white. The LGAs are labelled with black text. The map shows that there are thirty LGAs in Metropolitan Sydney. These are listed in alphabetical order: Bayside, Blacktown, Burwood, Camden, Campbelltown, Canada Bay, Canterbury-Bankstown, Cumberland, Fairfield, Georges River, Hornsby, Hunters Hill, Inner West, Ku-ring-gai, Lane Cove, Liverpool, Mosman, North Sydney, Northern Beaches, Parramatta, Penrith, Randwick, Ryde, Strathfield, Sutherland, Sydney, The Hills, Waverley, Willoughby and Woollahra. The LGAs that are shaded light green are considered greenfield areas; these are Blacktown, Camden, Campbelltown, Fairfield, Liverpool, Penrith and The Hills. (Note: For the

purposes of this research Hornsby is not necessarily considered a greenfield development LGA although it does have large tracts of peri-urban land and bushland). The LGAs that are shaded dark green are considered brownfield areas; Bayside, Burwood, Canada Bay, Canterbury-Bankstown, Cumberland, Fairfield, Georges River, Hunters Hill, Inner West, Ku-ring-gai, Lane Cove, Liverpool, Mosman, North Sydney, Northern Beaches, Parramatta, Randwick, Ryde, Strathfield, Sutherland, Sydney, Waverley, Willoughby and Woollahra. The bulk of the greenfield LGAs are in Western Sydney, extending from the northwest to the southwest. Brownfield areas are located in the Eastern half of Sydney.

1.2.2 Overview of research methodology

This research uses a pilot and two-round Delphi approach administered online, separate semi-structured interviews, and secondary data analysis as a framing tool to explore the perceptions and opinions of NSW government-based and local council-based planners from across Sydney. It asks: how do current decision mechanisms and processes for establishing new local park provision affect open space outcomes and how effective are policy strategies in ensuring adequate park provision?

Thematic analysis was used to analyse the findings of the Delphi study and semi-structured interviews, from which six themes emerged:

1. Availability of funding, along with the sub-theme of the adequacy of developer contributions and state government grants.
2. Availability of land in brownfield and greenfield areas.
3. Community demand and local council capacity to deliver.
4. Relevance and applicability of current public open space standards.
5. Engagement with state environmental planning policies and metropolitan planning priorities by local council.
6. Local Park innovation and collaborative shared-space programs.

1.2.3 Data collection and analysis

Primary data collection for this research took place between December 2021 and September 2022. 14 planners from NSW state government and local councils

with jurisdictional responsibilities for open space provision across Sydney participated in the Delphi study. To better triangulate the Delphi findings and address a self-selection bias among potential participating organisations, a semi-structured interview phase of the research was introduced to extend the narrative enquiry and ensure a more holistic representation of local councils from across Sydney. Three planners from NSW local councils who had not previously participated in the Delphi study took part in the semi-structured interviews. The semi-structured interviews were between 45 minutes and 60 minutes long and discussed the findings of the Delphi study. Therefore, a total of 17 participants completed the primary data collection phase of the research.

A Delphi method was chosen as a means of data gathering as it is a valuable approach in collecting a diverse range of perspectives from multiple experts at once. The Delphi method allows for participant anonymity, iteration and reflection, but mitigates group dynamics, power imbalances and distractions that can hinder thematic clarity or discussion (Rowe & Wright, 2011).

Semi-structured interviews are a mode of narrative enquiry that allows for open-ended conversation, immediate feedback and clarification. They are also a popular and accepted means of gathering in-depth information (W. Adams, 2015). The Delphi and semi-structured interview phases of the research were anonymised, and participant details were revealed neither to participants within the group nor externally.

Thematic analysis is a flexible means of data analysis that, as a foundation of qualitative research, goes beyond summarising content to a discretionary means of identifying, interpreting, analysing and prioritising patterns of meaning (themes) from primary or secondary data. It is thus an effective tool for organising data into clusters of similarity, highlighting contrasts and making meaning from multiple resources in an efficient way (Braun & Clarke, 2006).

Using a combination of Australian-based planners from the various state governments and local councils as research participants is not unique. Bush (2020) used semi-structured interviews with a range of stakeholders from various Melbourne-based community organisations and local councils in her Melbourne-based study, which analysed greenspace policies across three neighbouring LGAs located in inner suburban ring, middle suburban ring, and outer suburban areas.

Torabi et al. (2020), also in a Melbourne-based local government focused study, used a co-design approach with a range of planners and researchers to consider a framework for evaluating parks as part of a network of greenspace. Morrison et al. (2021) used an online survey to gather the opinions of NSW-based built environment professionals that included representatives from state government and local councils along with other stakeholders in relation to urban planning and public health outcomes. In their Sydney-based study, Lin, Thompson et al. (2023) ran an online in-depth focus group with park providers, designers and planners to explore how these stakeholders viewed the benefits of parks in urban environments. Boulton, Dedekorkut-Howes and J. Byrne use semi-structured interviews of Queensland local government-based planners as part of their ongoing research (largely based in Southeast Queensland) into various aspects of urban planning and open space provision (Boulton et al., 2021, 2022). Bolleter, Edwards, Cameron et al. (2022) used an online survey to canvas the opinions of planners from across Australia regarding the role urban planning could play in increasing urban/public health outcomes post-pandemic. Similarly, other studies around the world have also utilised the opinions of planners to gain a deeper understanding of open space provision, including from the UK (Shams & Barker, 2019), Europe (Aalbers et al., 2019; Baycan-Levent & Nijkamp, 2004; Hansen et al., 2023; Kabisch, 2015; Van Renswouw et al., 2022) and the USA (Bengston et al., 2004).

Similarly, using a Delphi method for consensus building regarding the importance, functions, use and value-add of greenspace from various perspectives is gaining traction as a qualitative method throughout the academic literature. Bolleter, Edwards, Freestone et al. (2022) used a Delphi survey to gather the opinions of planners regarding potential future settlement patterns across Australia. Bolleter and Hooper (2021) surveyed planners regarding scenarios to increase the urban forest in Australian suburbs. Elderbrock et al. (2020) used a Delphi method to survey greenspace managers as part of a larger study in relation to neighbourhood-based greenspace provision in the US state of Oregon, while James et al. (2009) used a Delphi study to establish a standardised approach to analysing greenspace provision across European cities. Perveen et al. (2017) used extensive literature analysis followed by a two-round Delphi study to ascertain a set of indicators for sustainable policy outcomes in response to rapid urbanisation.

Through using Sydney as a case study, this research provides a platform for planners to express their opinions regarding the challenges and solutions of open space provision as they experienced them across Sydney and across differing tiers of urban governance frameworks and diverse forms of urban environments such as brownfield or greenfield areas. Therefore, this research plays a role in extending the evidence base of the importance of understanding the supply mechanisms of local parks across a diversity of situations, and the likely outcomes if societal value, policy and delivery processes of open space provision do not adjust to the new reality of denser cityscapes and population growth.

Several secondary data sources were used as a means of triangulating the findings from the primary data collection phase of the research. These included: 1) NSW based policy and planning documents related to open space provision (DPHI NSW, 2024e, 2024j); 2) Funding allocation data for new open space provision and associated amenity from the NSW Department of Planning and Environment spanning 2018-2023 (DPHI NSW, 2024d; DPHI NSW, 2024h; DPHI NSW, 2024i; TFNSW, 2024b); 3) NSW Department of Planning and Environment data from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020); 4) NSW Office of Local Government data from the *Time series data 2020-2021* (OLG), spanning the financial year of 2021-2022 (OLG NSW, 2024b). Local council key performance indicator data informed results regarding developer contribution data and, combined with the former NSW Department of Planning and Environment population and dwelling projections data, contributed to estimations of the results of current and future open space provision for Sydney up until 2041.

1.2.4 Thesis presentation

There is an increasing recognition across the scholarly literature for research to be more accessible to diverse audiences as a way of creating greater reach and impact (APA, 2022; Brown et al., 2018; Menzies et al., 2022; Neves, 2022). The presentation and layout of this thesis extends the work of Carnemolla et al. (2023), Frumkin (2021) and Pham (2020), whose respective maps and graphics were accompanied by descriptions immediately above or below each figure that conveyed the information equivalent of what was represented in each figure. Where traditional data visualisation techniques are used in this research, including maps, graphs,

figures and tables, a long-form narrative description has been consistently and methodically provided immediately below each figure. Long-form narrative descriptions are differentiated from the body text by a thick green line down the left-hand margin and the text is indented.

Inclusive data practices are based on a variety of methodologies, and they fundamentally alter how a document appears and is engaged with, and in many cases how the research itself is approached and understood by researcher and participant[3]. Inclusive data practices are an important aspect of research design that go beyond data presentation to a deeper level of knowledge acquisition and dissemination. This is why they are included as a core component within the research methodology. Further justification and details regarding the use of an inclusive approach in the presentation of this thesis are provided in Section 3.8; “Inclusive practice document considerations”.

A set of replicated greyscale maps and figures in this thesis are provided in Appendix A: Greyscale maps and figures. These are for readers who experience difficulty interpreting colour. It is not necessary for a reader to engage with either the greyscale maps and figures or long-form narrative descriptions included in this thesis; they are provided as an alternative means of conveying information and of creating a more accessible interaction for readers if required or preferred. The layout of this thesis is based on increasing audience equity rather than perpetuating audience assumptions.

1.3 Sydney as a case study

The following section examines modern urbanisation and why Sydney was selected as a case study city. It also provides a definition of Sydney and that of a metropolitan area.

1.3.1 Modern urbanisation

Cities around the world are reconfiguring urban sprawl to denser polycentric cities/regions. International examples include a European study by Schmitt et al. (2022), who use Dusseldorf and Stockholm as their case study examples of polycentric city scales. De Vidovich and Scolari (2022) used Milan in the northwest of Italy to explore the nuances of modern urbanisation as a good fit for polycentricity,

and Cucuzzella et al. (2022), in their Canada-based study, use Montreal as their case study example for the potential of transport-oriented development to enhance city/regions. In a domestic context, this is seen through initiatives including the expansion of the Greater Cities Commission from the *Metropolis of Three Cities* (GSC, 2018) to a *Six Cities Region* (GCC, 2022), and Southeast Queensland (SEQ) *Shaping Southeast Queensland* (State Government of Queensland, 2023).

Australian capital cities have recently shed their longstanding preference for a single high-density central business district (monocentric urban model) that graduates into medium-density and then low-density urban sprawl, surrounded by a flexibly defined greenbelt (Gleeson, 2004). Higher density living in Australia is a relatively new phenomenon compared to cities such as New York or Singapore (Corkery & Marshall, 2018). Australian capital cities are reconfiguring urban sprawl in favour of higher density living in the form of infill development (Bolleter & Ramalho, 2019; Hill et al., 2021; Newton et al., 2022). The push for infill development across Australian state capital cities/regions has implications for greenspace provision, with many jurisdictions already facing challenges regarding shrinking or inadequate urban greenspace (Bolleter & Ramalho, 2019; Boulton et al., 2018; Haaland & van Den Bosch, 2015; Searle, 2011).

Open space policies in Australia and elsewhere have been formulated to help cities grapple with the effects of urbanisation (Haaland & van Den Bosch, 2015). It follows that a deeper understanding of the barriers and enablers to open space policy is required if successful open space policy outcomes are to be met.

The state government's recognition of the need for park provision to ensure the sustainability, liveability and productivity of cities is widely identified in the various policy documents and planning guides it administers. These include the *Sydney Green Grid* (DPHI NSW, 2024s), the *Public open space strategy for NSW* (DPE NSW, 2022) and the *Framework for valuing green infrastructure and public spaces* (DPE NSW, 2023). However, there is a mismatch between park provision values in theory and how they are translated into practice (Alizadeh et al., 2022; Boulton et al., 2018). One of the biggest challenges is the chronic under-valuing of open space as an essential public good. This problem is documented repeatedly in state government policies including the Government Architect guide titled: *Greener Places – An urban green infrastructure design framework for New South Wales* (GA NSW,

2020) (hereby referred to as *Greener Places),* and the subset of tools and frameworks administered across various government agencies. For example, the *Public open space strategy for NSW* (DPE NSW, 2022) further reiterates *Greener Places* (GA NSW, 2020), once more strongly recommending that, to ensure open space can thrive, it must be accounted for as infrastructure that is essential to the creation of liveable neighbourhoods, cities and regions, not just discretionary "amenity". These are themes that emerge time and again throughout this research. Further details in relation to the urban governance, policy and legislative frameworks for open space provision are provided in Chapter 4.

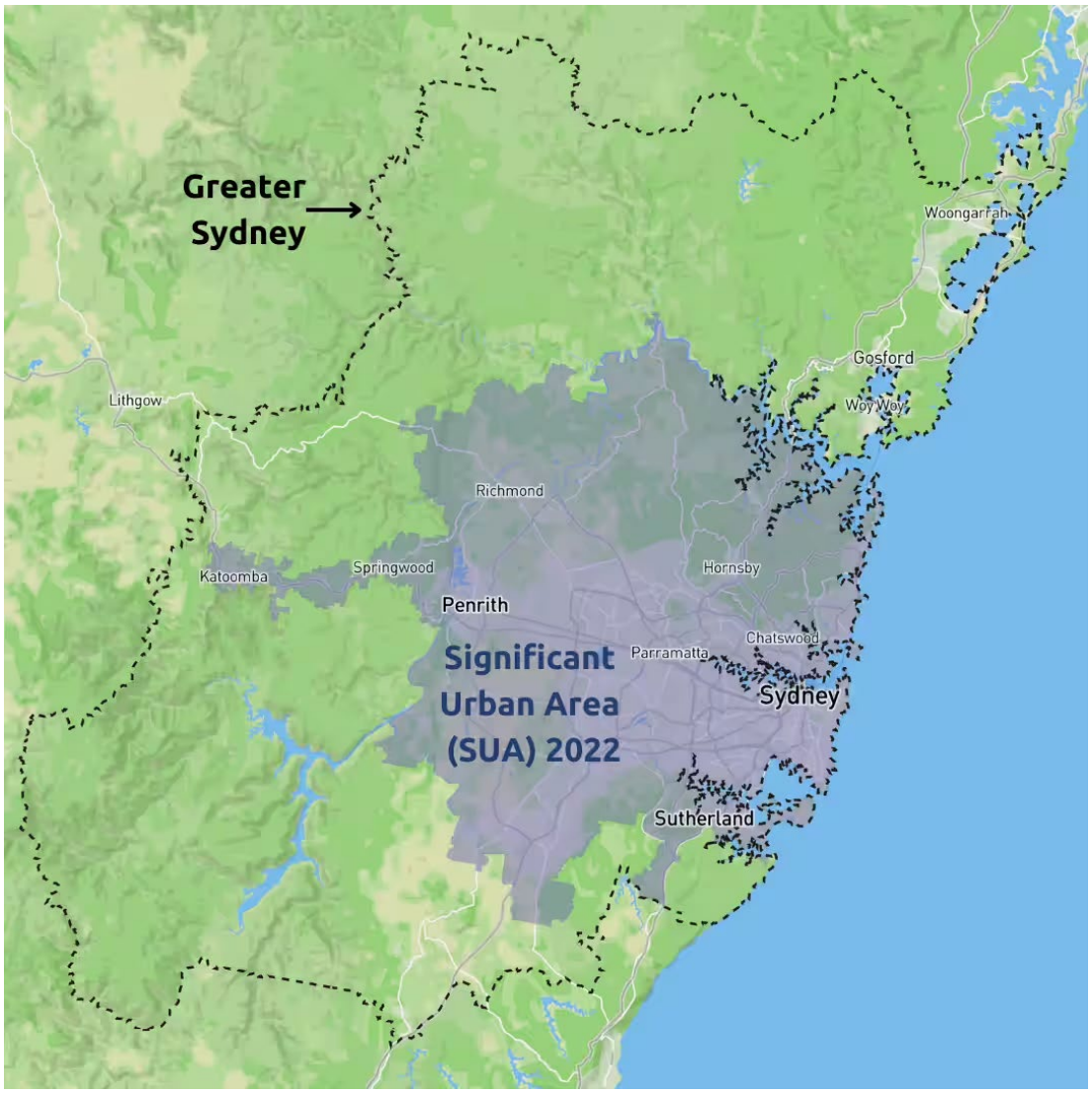
The gap between aspirations for and achievement of open space standards and applications is not unique to Sydney or Australia. Other countries around the world grapple with inconsistencies across open space policy and data definitions (Feltynowski et al., 2018). According to Barnett and Beasley (2015), the USA and Canada have faced similar issues regarding their urban planning policies, guidelines and laws. Policy and strategy plans have not translated seamlessly into practice, thereby creating a cycle of catch-up. As in Australia, previously unforeseen factors, such as population growth, have had a greater and more immediate influence over the built environment than previously imagined.

1.3.2 Metropolitan Sydney

Sydney is located on the eastern seaboard of Australia. The latitude of Sydney, NSW, Australia is 33.865143, and the longitude is 151.209900. Sydney is a coastal city, barriered on all sides; from the Pacific Ocean in the east to a mountainous ridge known as the Great Dividing Range in the west, and by the otherwise untenable sandstone plateaus which rise in the north and south. The Sydney Metropolitan Area extends from its 'origination' in 1788 on the banks of Sydney Harbour (commonly referred to in a local context as 'the harbour') on the eastern edge of the city. Today, the bulk of Sydney covers the Cumberland Plain, also referred to as the Sydney Basin, reaching westward to the Blue Mountains. It encompasses the area north of the harbour, bounded by Ku-Ring-Gai National Park and the Hawkesbury River in the north, and sprawls southward of the harbour to Port Hacking River and the Royal National Park. Sydney is also traversed by other rivers and waterways which impact urban form and development (CFS, 2018).

Sydney is known and referred to by multiple definitions. Unless otherwise stated, in this thesis the term “Sydney” (or “Metropolitan Sydney”) refers to the Australian Bureau of Statistics’ (ABS) definition of the Significant Urban Area (SUA) of Sydney (ABS, 2021b)[4]. The distinction between Greater Sydney and the Sydney SUA is important because the provision of parks relative to alternative greenspace resources differs significantly between Greater Sydney and the Sydney SUA, as shown in Figure 2. Greater Sydney has more national park coverage and semi-rural lands as part of its make-up compared to the Sydney SUA. It is assumed that city dwellers may not value local parks as much in greenfield areas, as the surrounding natural green resources are a close trade-off for semi-urban living. Their inner-ring and middle-ring suburban counterparts suffer from a lack of open space owing to population and density infill development, as reported by Core Logic Australia in their *Property and Greenspace Report* (Core Logic, 2021). According to the Australian Census, Sydney is currently the most populous city in Australia, with a population of 4,830,047 in 2021 people (ABS, 2021b).

Figure 2
Greater Sydney and the Sydney SUA



Source: Riches and Baghdadi (2023).

Figure description: Figure 2 shows a land-use map of Greater Sydney and its immediate surrounds. Sourced from Riches and Baghdadi (2023). The map indicates major roads and maritime boundaries = various colours, national parks, and state forests = green, waterways = blue and other areas = beige. The map is overlaid using two administrative boundaries, which are based on ABS administrative outputs. The first boundary is the Sydney Greater Capital City Statistical Area (GCCSA) 2021 boundary, and the second is the Sydney SUA 2022 boundary. The Sydney SUA 2022 is shaded purple and labelled SUA 2022[5]. The Sydney Greater Capital City Statistical Area (GCCSA) 2021 boundary is indicated by a broken black line and labelled Greater Sydney, with a black

arrow pointing to the boundary. The map shows the relationship between the two boundaries and their relative sizes. The larger Sydney Greater Capital City Statistical Area (GCCSA) 2021 boundary extends from the Central Coast in the north to Bargo in the South, and from the Blue Mountains National Park in the west to the east coast. The smaller Sydney SUA 2022 boundary is fully contained within the Sydney Greater Capital City Statistical Area (GCCSA) 2021 boundary. It extends from Wisemans Ferry in the north to Appin in the south (not labelled on the map) and from Katoomba in the west to the east coast.

1.3.3 The strength of Sydney as a case study city

Sydney is considered one of the most liveable cities in the world. However, the city is facing a problem. Sydney is rapidly densifying with a strong recent history of urban growth (Pinnegar et al., 2020; Searle, 2011, 2020)[6], making shared public open space more significant as a result.

Parks in Sydney have a valued role in ensuring that the city can remain functional in the face of rapid change. This includes changes to the built form, infill targets and population growth. Sydney is not a city of homogenous neighbourhoods. There are well-established areas of amenity; some of these are rapidly densifying and other parts of the city are greenfield areas earmarked for future development and, by implication, densification (GSC, 2018b). This makes Sydney an interesting case for examining the emerging approaches to park provision across jurisdictions, from NSW state government and local council planner perspectives, and within the policy and structural mechanisms provided by NSW legislative frameworks, guidelines and planning circulars (DPHI NSW, 2024r; NSW Legislation, 2023, August 15). Given the diverse characteristics of topography, density, demographics, land zone usage and jurisdictional priorities across Sydney, what if anything drives different approaches to park provision decision-making and priorities? And what, if anything, can be learned from these perspectives when considering current and future open space policy across Sydney?

The formation of the city itself, as well as the focus on urban growth and higher densification is guided by two thematic elements: reputation and planning principles. In Sydney, the global city discourse, which is designed to enhance the reputation of the city, informs part of the idealism behind greenspace allocation from a top-down

governance perspective (Acuto, 2012; Corkery & Marshall, 2018; GSC, 2018a, 2018b; Hu, 2015a, 2015b; MacDonald, 2016; Schaffer, 2019). Open space provision is guided by an integrated planning model that filters through a hierarchy of geographic priorities that scale accordingly, extending from state government to local council implementation. Open space provision is informed by legislative requirements, public policy, community feedback, public benefit, financial and land allocation mechanisms, and state government and local councils, for example, precinct development (DPHI NSW, 2024n).

In short, there are three interlocking elements that underpin the practice and supply of park provision across Sydney: 1) planning legislation and policies; 2) funding mechanisms; 3) land supply. All these elements reference the *NSW Environmental Planning and Assessment Act 1979* (NSW) as a means of administration and enforcement, along with state environmental planning instruments (DPHI NSW, 2024r) and numerous other acts such as the *Local Government Act 1993* (NSW) or the now repealed *Greater Cities Act 2022* (NSW). Everything else, including ideals of liveability, sustainability and productivity, as outlined by the Greater Sydney Commission in the *Greater Sydney Regional Plan: A Metropolis of Three Cities – Connecting People* (GSC, 2018b) (hereby referred to as *A Metropolis of Three Cities*), is directly or indirectly related to these three elements.

In the case of the *A Metropolis of Three Cities*, each level of Australian government (federal, state and local)[7] appears to have a larger stake than is seen in other domestic regions in how Sydney is formed, branded, and bound. However, as McGuirk (2003) long since recognised, owing to multiple reasons, agendas, and positioning, Sydney's urban politics is layered with nuances and complexity. McGuirk suggests that a higher level of urban governance and politics of scale is necessary to ensure that Sydney, as the global gateway and economic powerhouse of Australia, maintains its status and rising position in the Global City thesis narrative, which in turn reinforces the agenda: what is good for Sydney, is good for Australia.

1.3.4 Definition of a metropolitan area

The definition of a metropolitan area provided by the United Nations (UN) is used in this document[8]. As the UN states in their *Glossary of Terms*, a metropolitan area is a contiguous territory and surrounding areas of a residential urban settlement,

under the direct influence of the city through infrastructure, amenities, and road and transport linkages (UN DESA, n.d.). A challenge facing the definition of a metropolitan area is that it has different meanings and scales in different contexts (Burton, 2017). Several LGAs were removed from this research, owing to their semi-urban, village-like separation from the contiguous built-up area of Sydney. These include the Blue Mountains LGA, Hawkesbury LGA and Wollondilly LGA. It is worth noting that as a means of classifying local councils into various groups for data and reporting purposes, the Office of Local Government defines the Sydney Metropolitan Area as an area that more closely aligns with the built-up metropolitan fringe (OLG NSW, n.d.).

Using an Australian interpretation of a metropolitan area is not unprecedented for considering greenspace provision (Frantzeskaki et al., 2022; Lin et al., 2015). Frantzeskaki et al. (2022) justify its use in their article emphasising how Australian cities could prioritise nature-based outcomes, rather than using jurisdictional boundaries. This thereby supports the suggestion that a metropolitan area is more reflective of the Australian way of planning governance, as Australian cities are usually governed by both state government and local councils (Abelson, 2023). Based on the joint responsibilities of state government and local councils for the provision of parks in Sydney, using a metropolitan boundary scale to define the scope of the case study area used in this research is therefore fitting[9].

1.4 Research outputs

This section summarizes the results of the research. It includes an overview of the thematic findings from the primary data collection (Delphi study and semi-structured interviews) and the whole of the research approach. This is followed by a brief discussion regarding how the results of this research contribute to the broader scholarly literature and the likely impacts it will have on policy and open space provision frameworks and considerations. This is followed by a summary of the thesis.

1.4.1 Research outcomes

This research explored the perceptions and opinions of planners from state and local government situated within Metropolitan Sydney and asked: how do state

government and local councils make decisions about establishing new local parks? As noted above, there were three main questions that drove this research. These were predicated on elements of park provision, potential inadequacies of park provision, and what strategies could be put in place to ensure open space provision inadequacies could be overcome.

This research aims to have a direct impact within a local, Sydney, and Australian domestic context. The research also has broader implications internationally. The use of a forecasting tool such as the Delphi method and qualitative enquiry through semi-structured interviews establishes what a select group of planners experience as important regarding the future implications of new park provision. These findings build upon alternative studies including those that examine local resident opinions and analysis (Herman & Drozda, 2021; Kleinschroth & Kowarik, 2020; Ugolini et al., 2020), urban design considerations (Bolleter, Edwards, Cameron et al., 2022; Honey-Rosés et al., 2021; Mell & Whitten, 2021; Rodgers, 2020), dwelling density (Hamidi et al., 2021) and the voices of planners (Bolleter, Edwards, Cameron et al., 2022; Boulton et al., 2021; Bush, 2020; Lin, Thompson et al., 2023; Morrison et al., 2021). This research contributes to the body of knowledge in line with national recommendations (Arundel et al., 2017; Infrastructure Australia, 2019), international research practices, such as the World Health Organisation Europe (WHOE) (2016) *Urban green space and health: Intervention impacts and effectiveness* report, greenspace recommended future research directions, and to the relevant sustainable development goals as published by the Sustainable Development Solutions Network on their living web platform (SDSN, n.d.).

Based on this research, a total of six themes and six key elements for open space provision emerged. The themes directly relate to the outcomes from the primary data collection (Delphi and semi-structured interviews) and the key elements are a culmination of data from across the research lifecycle. This includes the literature review, the policy document analysis, the secondary data analysis from the NSW Department of Planning and Environment and the Office of Local Government, and the primary data (Delphi and semi-structured interviews). Although the results are similar, they each play a different role within the research and by extension to the contribution of knowledge in the field. The themes can be considered internal to the

research, as they are direct findings from a select group of planners working in state government and local council capacities from across Sydney in 2022. The key elements to emerge from the research are based on multiple data sets, policy documents and academic literature, thus are found to be beyond the immediate case study to other jurisdictions and stakeholders experiencing similar challenges regarding open space provision.

The themes to emerge directly in relation to the research are:

1. Funding: Greater funding and flexibility of funding avenues in relation to park provision for local councils that include the procurement of state grants, and how developer contributions are allocated and managed. This includes additional open space upkeep budgetary considerations that go beyond current funding avenues of local rates and other minimal local council charges currently available.
2. Land availability: Higher priority to open space provision for new parks that is reflected through adequate land allocation, particularly in highly densifying areas (including the push toward transport orientated development). This not only increases quality open space outcomes, but also increases connectivity between open spaces, increases the variety of spaces available to the community and allows for multi-purpose uses that are more reflective of successful overseas examples of quality open space networks and linkages to active and public transport and other city infrastructure.
3. Community expectations and engagement: More robust community engagement that is more interactive and equity-based than at present and that creates greater community awareness of and for open space provision. Along with this should be increased negotiation capacity for planners in relation to park provision to reach better outcomes more efficiently. This would include greater prescriptiveness by the state government so that planners have more resources at their disposal to negotiate with developers and enforce good-quality park outcomes fit for purpose.
4. Open space standards: A more functional approach to open space standards that reflect land usage beyond population, access or land-percentage standards. This would enable a more accurate picture of open

space adequacy to be analysed, and a more flexible approach to what and how open space is measured to be applied to LGAs. It would include as open space high streets, linear parks, rooftop parks, shared-space programs such as school yards, parklets, pop-up parks and other smart park designs, but exclude dense bushland or other unusable public space owing to its typology or other similar factors.

5. Policy priorities and objectives: Continued scaled frameworks for open space provision to provide the checks and balances that will ensure that minimal standards are met, but with greater emphasis on optimal place-based outcomes as well as metropolitan connectedness.
6. Innovation and non-traditional parks: A more proactive approach to park innovation and smart park design that goes beyond novelty projects or the current ad hoc attitude to smart park design and one that can be better integrated into the urban fabric with greater efficiencies of scale and connectivity.

The results as listed above contribute to the practical understanding of the barriers and enablers to park provision experienced across Sydney by planners in 2022. Primary data revealed that current mechanisms and decision environments were not always adequate for supplying appropriate open space. This included current funding and land allocation processes specific to open space provision, changing community expectations regarding open space amenity, the use and value of open space standards as a measurement of actual versus functional open space provision, patchy engagement with open space policy frameworks, and resistance to park innovation and design unless absolutely necessary.

Secondary data analysis of future land uses and population projections further revealed that open space in Sydney is already inadequate in several LGAs. This deficit in local park provision to meet city-dweller needs will become more prevalent as urban densification increases across Sydney and the population increases. Therefore, the need for more innovative approaches to open space provision is required if Sydney is to remain liveable, productive and sustainable moving forward. This data is in line with previous and existing NSW based policy narratives and the broader academic literature on the topic.

Therefore, this research further highlights the known challenges facing the provision of open space not only within the case study, but more broadly as reflected within the academic literature. The practical understandings provided by this case study can be applied to other jurisdictions facing similar challenges regarding open space provision. This is relevant because as noted previously, Sydney is not the only city in the world navigating the consequences of urbanisation.

1.4.2 Contributions to the literature

This research addresses a notable gap in the literature by presenting a case study of the resourcing and regulatory frameworks underpinning park provision across Metropolitan Sydney. The research advances existing scholarship on urban governance by examining how these mechanisms differ across brownfield and greenfield contexts in a multi-tiered democratic system, within a constrained regulatory environment and a rapidly densifying urban landscape. The findings offer empirical insight into the complexities of park provision and contribute to a more nuanced understanding of decision mechanisms, resource allocation and policy in a diverse, high-growth city.

Through offering a critical, practice-informed perspective from planners working at the nexus of policy and implementation, this research identifies six key elements essential to park delivery and highlights how planners' capacity to deliver public open space is increasingly shaped by political, market, and neoliberal pressures that deprioritise public benefit. By situating these insights within the broader urban health, city-shaping, policy and sustainability discourse, the study contributes a nuanced understanding of how park provision can be more effectively achieved in constrained regulatory contexts. Although grounded in a Sydney based case study, the findings offer transferable insights for other cities grappling with similar tensions between growth, equity, and open space provision and park innovation.

The findings are a valuable resource for academics, government agencies, planners, developers and community groups. They can help these stakeholders better understand how decisions are made about park provision and more broadly open space preferences, priorities and capacities. City dwellers and community groups gain insight into how to influence the government’s priority-setting process

once they have a deeper understanding of how it works. Developers benefit from a clearer understanding to inform their decisions about the in-kind provision of local infrastructure through voluntary planning agreements. Planners and government entities benefit from the lessons this research might offer for more adaptable policymaking in rapidly changing situations.

Finally, this thesis contributes to the literature on data visualisation by demonstrating the integration of accessible data visualisation practices within a social science research framework. While accessible visualisation methods have gained traction within fields such as computer science and disability studies, they remain largely absent in mainstream social science literature. To the author's knowledge, this is the first instance of such practices being embedded in a thesis outside disciplines traditionally concerned with inclusive technologies or disability research. By adapting approaches more commonly used in scientific fields — where complex data is accompanied by narrative explanation to support diverse interpretive needs — this research extends the literature on inclusive knowledge production. It challenges conventional data dissemination protocols, such as those adhering strictly to technical web accessibility standards by exampling a user-oriented model of visual communication. This opens new avenues for how mainstream social science research can be presented, accessed, and understood by a broader audience, including those historically excluded from data engagement due to inaccessible design. This contribution deepens the discourse on epistemic inclusion and positions accessible visualisation as a legitimate and impactful methodological practice within social science research.

1.5 Summary of thesis

The current chapter, the “Introduction”, has provided an overview of the research, which was to directly investigate the provision of parks in Sydney from a state government and local council planner’s perspective. Knowledge is limited regarding the capacity of state government entities and local councils to respond effectively through policy and structural mechanisms to the changing community expectation and demand for park provision. The current chapter also introduced the aims of the research, which were to deepen the understanding of park provision processes across Sydney, and the capacity for policy to respond to a shifting social

landscape and set of expectations. However, this research has relevancy beyond the geographical confines of Sydney as a case study area. It contributes to broader challenges regarding city shaping priorities and delivery mechanisms. These findings are relevant across the world as governments increasingly rely on private interest to fund public goods and planning is coopted into systems that favour a neoliberal approach.

There were six themes to emerge from the research that also form the recommendations for this work: 1) Funding; 2) Land availability; 3) Community expectation and engagement; 4) Open space provision; 5) Policy priorities and objectives; 6) Park innovation.

The second chapter, the “Literature review”, situates the research within a broader spectrum of literature focused on the various aspects of urban greening and open space provision, and the implementation challenges therein. This includes outlining the benefits and definition of open space, and city-dweller relationships toward urban greening and open space. Followed by the various forms of park innovation as directly related to the case study. Further included is a discussion on the measurement of open space both in economic and spatial accessibility terms. As well as an examination of open space policy processes and practitioner and community engagement. There is also a discussion on the relationship between open space provision and densifying environments. Lastly, a brief examination of the increased popularity of open space throughout the pandemic and the potential for city-shaping discourse.

The third chapter, “Methodology”, provides an overview of the philosophical considerations underpinning this research. This is followed by an outline of the secondary data analysis, the Delphi method and the separate but complementary semi-structured interviews. Participant recruitment and ethical considerations for the research are also provided. This is followed by an outline of how the data was analysed through thematic analysis and document analysis. Lastly, an explanation of the methodological process used to ensure this thesis is inclusive to different reader preferences or requirements is provided.

The fourth chapter, “Planning, policy and funding for open space provision”, focuses on Sydney as a case study. It describes the statutory planning instruments relevant to open space provision, followed by the current metropolitan planning

strategy for Sydney. This is followed by a thematic analysis of open space policy. Penultimately, developer contribution proxy values aggregated to an LGA level are examined to demonstrate the differences in resource allocation and local council priority across jurisdictions. Lastly, funding allocation from the former NSW Department of Planning and Environment for open space provision is estimated.

The fifth chapter, “Urban density and land use for open space provision”, focuses on the resource allocation for open space in Sydney. It examines the land percentage footprint for open space, the typology of park provision, the drivers behind future open space provision, and a series of secondary data analyses of the current and likely future scenarios of open space provision across Sydney aggregated to an LGA level.

The sixth chapter, “Findings from state and local planner perspectives”, provides an in-depth analysis of the six themes that emerged from the research as noted above.

The seventh chapter, the “Discussion”, situates the findings from across the case study (presented in Chapters 4, 5 and 6) within the broader literature. Firstly, by identified theme/element as listed above, and secondly by directly answering the three research questions also listed above.

Lastly, the “Conclusion” summarises the thesis, discusses the six key elements essential for park provision as recommended as a result of this research, explains the existing limitations of the research, provides recommendations for further investigation, and reiterates why this research matters and how its relevancy extends beyond the immediacy of Sydney as a case study to the broader discourse on city-shaping priorities.

Chapter 2: Literature review

2.1 Introduction

This research explores the range of state and local government decision-making environments in place to facilitate the provision of new parks as a means of creating healthier and more sustainable cities, using Sydney as a case study area. Chapter 1 introduced the research and provided a synopsis of what is involved, why it is important and what it hopes to achieve. Building on the outline of the research problem, the current chapter situates this thesis within the broader greenspace-focused literature. The chapter is divided into seven sections. The first section situates urban greening into public space and city life. This includes the definition of a local park and the approaches to urban greening. The second section discusses the challenges of valuing parks in economic terms. The third section examines research relevant to the policy process and stakeholder engagement. The fourth section examines the provision of parks in densifying environments. The fifth section discusses park provision standards and measures. The sixth section focuses on the impacts of the COVID-19 pandemic on park provision. The last section provides a summary of the literature.

2.1.1 A note on context

The academic literature referenced throughout this thesis draws on articles that are exclusively in English. The literature is largely focused on the developed countries of the Global North as opposed to the under-developed countries of the Global South. This is because the English/Anglo, Western European, New Zealand, American and Canadian-based literature more closely aligns with the economic, democratic and urban planning processes/reasoning adopted in Australia than the Global South (Dados & Connell, 2012). This is not to dismiss the literature from the Global South regarding greenspace provision; rather, it is an acknowledgement that the broader mechanisms put in place in relation to urban planning governance differ compared to the Global North. However, there are similarities across the literature regarding the challenges faced by Global South cities with rapidly densifying

environments in the delivery of functional open space to the health and sustainability of cities and city-dwellers, which is why the topic is briefly noted here as both relevant to the broader literature, and to the contribution of this thesis to broader city-shaping debates and delivery mechanisms. This thesis offers valuable insight into the barriers, enablers and potential considerations for park provision in urban environments the world over.

Based on the research into park provision from both the Global North and Global South, a broad theme emerges regarding the plight of park provision amid densification and urbanisation. As cities urbanise, there is a loss of greenspace, regardless of economic development status in the hierarchy of global city discourse. Comparison is difficult because planning mechanisms and influences on park provision from a policy and supply perspective differ across regions.

2.2 Public space, city life and urban greening

Historically, public space has fulfilled many functions within human settlements; as a “commons” with an economic function (providing grazing, hunting, and gathering grounds), as symbolic spaces for assembly (public squares and amphitheatres), as natural spaces providing ecological services (flood control, habitat, and air purification), and as spaces for relaxation and play (sports fields, parks, gardens, and playgrounds) (UNESCO, 2011). Public space is crucial for practices of everyday life (Carmona, 2021; Gehl, 2011; Jacobs, 1961). Birch (2008), Frumkin (2021) and Stanley et al. (2012) all note that as civilisations, communities and cities have evolved, public space has developed in tandem. On the surface, the benefits of public space for our communities are straightforward. Well-designed and maintained public space is a critical element to the health of any city and the city-dwellers therein. Such gathering spaces are open to everyone and allow for social mixing, civic participation, recreation and foster a sense of belonging (UNESCO, 2011; UN-Habitat, 2016). However, public space is not all greenspace. In dense urban areas, public space may not deliver adequate greenspace. Growing deficits mark the effects of urbanisation and densification, a challenge that is recognised by scholars across the world (Balikçi et al., 2022; Beer et al., 2003; Boulton et al., 2018; J. Byrne & Sipe, 2010; Colding et al., 2020; Haaland & van Den Bosch, 2015).

The benefits of urban greening as a sound means of achieving public space that is welcoming socially and from a biodiversity-viewpoint are well-established (J. Byrne & Sipe, 2010; Littke, 2016a; Konijnendijk et al., 2013; Pincetl & Gearin, 2005; C. Thompson, 2002). The biodiversity-based benefits of greenspace, although impacting the human experience, are more aligned with ideas of environmental ecology, sustainability and environmental protection as their primary focus (Pakzad et al., 2017). However, the multifunctionality of ecosystems deliver multiple benefits simultaneously irrespective of the purpose for which they were designed, installed or maintained.

Park-based benefits can be classified into human-centric and biodiversity-based benefits. As a biodiversity-based consideration, parks contribute to infrastructure to form part of a wider urban greening and connectivity initiative as exampled by the *Sydney Green Grid* (DPHI NSW, 2024s). They also provide a habitat for local animals, flora and fauna (Zivanovic & Luck, 2016), provide air purification (Vieira et al., 2018), stormwater mitigation (A. H. Roy et al., 2008) and sound barriers (Nieuwenhuijsen, 2021). They mitigate climate change and the urban heat-island effect (Bartesaghi-Koc et al., 2020), and they help meet greenspace targets and standards (Veal, 2013).

Often human-centric and biodiversity-based benefits occur in tandem, such as increased biodiversity resulting in better human health outcomes (Frantzeskaki et al., 2022). In some cases, however, they can work against one another, such as when a perceived benefit to the human experience of urban greening may not benefit an animal habitat. The literature shows that the ways in which human-centric and biodiversity-based benefits and challenges, and the implementation of urban greening initiatives are examined are diverse.

Comparing the relevance of the human-centric and biodiversity-based benefits to this research, the human-centric benefits were considered more relevant because park provision was considered a land zone specifically set aside for the benefit of city-dwellers. Other land zone uses, such as bioswales, green corridors, conservation areas and national parks are more focused on benefits to biodiversity. This is not to say that biodiversity-based benefits are not or should not be an important consideration when considering park provision. As stated previously, biodiverse benefits directly feed into the quality of life of the city-dweller experience. Therefore,

as an argument for why park provision needs to be considered and valued more highly as a necessary infrastructure, biodiversity-based benefits are briefly acknowledged for their impact in this research.

From a human-centric perspective, well-maintained parks are widely recognised as adding economic enhancement such as cost savings to the health system (Ahmadpoor & Shahab, 2021; J. Byrne & Sipe, 2010) or the increased value of surrounding property (Brander & Koetse, 2011). They also provide social capital and value to the backdrop of community life in qualitative ways (Ellis & Schwartz, 2016; Konijnendijk et al., 2013; Sadeghian & Vardanyan, 2013). These can be identified as improvements to mental health (Astell-Burt & Feng, 2015, 2019; Barton & Rogerson, 2017), physical health (Browning et al., 2022; Twohig-Bennett & Jones, 2018), increased experiences of individual well-being and broader social and community networks (Ambrey & Fleming, 2014; Bush & Doyon, 2017) and aesthetic appeal (Elsadek et al., 2020). As to how these benefits are achieved and to what extent they are considered, engaged or implemented, plus who is responsible for influencing and/or enforcing park provision in cities, throughout regions and across countries, is the subject of much scholarly research (Bengston et al., 2004; Bush, 2020; Davies & Lafortezza, 2017; Hansen et al., 2023; C. Thompson, 2002).

For the purposes of this research, the benefits of open space apply to the everyday function and experiences of city-dwellers and include experiences and functions on either an individual or collective level of various urban greening initiatives and relate to a diverse range of activities and characteristics. Examples include the types of urban greenspace provision people prefer (Farahani & Maller, 2018), how and why people access certain types of greenspace and avoid others (this may include size and distance to open space) (Giles-Corti et al., 2005) or personal perception (Ambrey & Fleming, 2014; D. Wang et al., 2015).

Despite the well-known benefits provided as a result of open space (Konijnendijk et al., 2013), there is also a recognition across the literature that local parks are not valued highly enough against other priorities such as housing, jobs, or GDP (Ahmadpoor & Shahab, 2021; Bush, 2017; Evans & Freestone, 2011). Therefore, a tension emerges regarding the provision of open space as a public good when measured against city-shaping discourse that values economic growth above all else.

Increasingly, scholars attempt to quantify and qualify the benefits of parks through such indicators and conceptual frameworks as liveability (Lowe et al., 2020), human health and wellbeing outcomes (Villanueva et al., 2015), spatial dispersion (Veal, 2020), ecological indicators (Bush et al., 2021) or sustainability (Pakzad et al., 2017). The fact that parks are differentiated from other infrastructure types by their original intended design as public benefits that are not directly priced makes them more difficult to evaluate inside traditional frameworks of direct cost/benefit analysis. Unlike other infrastructure, such as roads, cycleways, footpaths, bus stops and housing, whose direct economic benefit to society is quantifiable, the value of parks is considered harder to measure. This therefore becomes problematic when open space as a public benefit is pitted against other city building service and amenity priorities. This research provides an opportunity for a broader conversation regarding how open space provision reflects and contributes to theoretical debates on urban planning and governance, policy effectiveness, and the actualisation of functional, healthy and sustainable cities.

2.2.1 Definition of a park and park innovation

This research situates park provision as a defined sub-element of public space but also acknowledges it as an inferred element within the broader context of open space and greenspace provision. Parks frequently overlap or are included as part of a broader land-use categorisation/public benefit in policy documentation and other literature. This is because parks are only one element of the public realm; they fit into several land-use categories, including public space, green space and open space.

Parks were chosen over the broader definition of open space which may include protected green corridors, bioswales, community gardens, parks and large parklands. Alternative open spaces include outdoor active recreational facilities such as golf courses, horse racing courses, sports stadiums, dog parks and sports fields. However, hospital grounds, cemeteries, church-owned land, private business precinct land, corporate greenspace, green plazas and school or university/privately-owned greenspace, were excluded from consideration.

All forms of open space provision contribute to the urban fabric of a city and mitigate many of the considerations listed above. They have different implementation protocols, funding mechanisms, purposes and usage expectations. Therefore, they

are likely to hold different proxy values related to investment decisions and provision processes within a local council context compared to park provision.

The term “park” is used throughout this research to denote the following: an urban park refers to a traditional twentieth century notion of a park, this is to say, land specifically set aside for recreation purposes, of any size ranging from the smallest of pocket parks of 0.02 hectares to a large urban parkland of 100 hectares or more (Cranz & Boland, 2004; Konijnendijk et al., 2013)[10].

A “local park” refers to a public open space specifically set aside for passive recreation. This may include several if not all of the following amenity or attributes: 1) green vegetation, grass, landscaping; 2) children's play equipment and/or adult exercise equipment; 3) water features/water play; 4) taps, bubblers, toilets; 5) seating, lighting and/or footpaths; 6) fencing and/or rubbish bins; 7) sized between 0.05 and 5 hectares.

“Water” is excluded from the definitional make-up of a local park, with any body of water beyond a fountain or children’s water play feature being viewed rather as “bluespace”. This is because “water” is one of several characteristics that differentiate parklands that are traditionally much larger than local parks such as those administered by the Sydney Parks Trust (Greater Sydney Parklands, 2024).

To qualify as a park innovation, a local park must meet one of the following criteria: be in a non-traditional location such as a linear park and use non-traditional surfaces, such as a rooftop park or a parklet. A pop-up park or shared space program are also considered park innovations as they use designated space differently compared to traditional parks of the past as described by Cranz and Boland (2004).

A smart park concept is defined as a park that uses smart digital and/or physical technologies, and/or innovative materials to improve the efficiency, functionality, use, safety, and sustainability of a park while increasing public benefit and reducing maintenance costs simultaneously (Kim et al., 2020).

A rooftop park, sometimes referred to as a sky park, or rooftop garden, is a form of ‘semi-intense’ or ‘intense’ green roof. As its name suggests, it is a park located on top of a building or structure, publicly accessible from the street. It contains

vegetation, irrigation, seating, lighting, potentially play equipment and other simple amenities for use by the public (Irga et al., 2017; Williams et al., 2010).

A parklet is defined as a temporary pop-up or fixed park located within the average width/depth of a car parking space or transport right of way that has been converted into a small recreational space, often with some form of vegetation and possible seating option in order to make it person-centric rather than vehicle-centric. They are often created as a means of improving streetscapes, social connectedness, pedestrianism or foot traffic for local economy, urban amenity and other micro-environmental benefits. For the purposes of this research, a parklet refers to the former use with an aspect of urban greening rather than as extended outdoor dining (Birdsall, 2013; Jarman & Stratford, 2023).

2.2.2 A further note on terminology

When the term “public space” is used, it refers to all spaces considered part of the public realm, such as roads, plazas, outdoor malls and open space. When the term “greenspace” is used, it refers to public and private greenspace combined. When the term “green infrastructure” is used, it refers to green roofs, green buildings, tree canopies, rain gardens and semi-permeable ground coverings. When the term “open space” is used, it refers to public open space such as passive open space that includes bushland and urban parks, and active open space such as sports fields – actual park typology considerations relevant to this research are provided in Section 5.3 “Park typology and function”.

When the term “passive open space” is used it refers to parks, play spaces, community gardens, foreshores, vacant lots, reserves, green plazas, natural linkages (linear parks) and spaces of greenery designated for rest and relaxation that are not considered bushland or other spaces not for human habitation. When the term “active open space” is used, it refers to sports fields such as soccer or rugby pitches, or courts such as tennis or netball, areas for physical activities such as bouldering and parkour parks or BMX tracks, and unbroken running or cycling loops; minimum of 1km (GA NSW, 2020).

Strictly speaking, several of these elements overlap, particularly in relation to state government funding initiatives, yet for the purposes of this research, although

they arose as a secondary theme within the findings, they were considered outside the definition of open space.

When the term population ratio or population ratio standard is used it refers to a prescribed level of provision of open space related to the level of population – typically per 1000 population. When the term land percentage ratio or land ratio standard is used it refers to a specified percentage of land to be reserved for open space. When the term catchment area or access catchment standard is used it refers to a specification, for various categories of open space, of the 'service area' or maximum distances which residents should have to travel to gain access. When the term local area is used it refers to standards of provision specific to a local area – based on local conditions, based on a variety of methodologies, and expressed in any of the above formats (Y. Hsu et al., 2022; Veal, 2020).

Most new open space is provided through what are known in Australia as ‘development contributions”. Development contributions are a common practice around the world used as a tax to fund infrastructures as a result of new urban development. They have many names including development charges or levies, infrastructure charges or levies, development or infrastructure impact charges or fees, or land use exactions etc. When the term development contribution is used, it refers to a capped payment from a developer to support a planning authority such as a state government entity or local council to provide associated services or new infrastructure resulting from the new development. A voluntary planning agreement is an agreement between the developer and a planning authority such as a state government entity or local council whereby the developer will provide the associated service or new infrastructure or an aspect or combination thereof, resulting from the new development (DPHI NSW, 2024p).

2.2.3 Approaches to urban greening

One of the most popular forms of urban greening is based on people’s innate connection with nature. There is a great deal of evidence to support this positive correlation between biophilic design and city-shaping outcomes on a local and metropolitan scale (Beatley & Newman, 2013; Downton et al., 2016; Littke, 2016a). It could be deduced that this innate human need for nature is the underlying driver for all open space policies, legislation, planning decisions and implementation, whether

unconscious or otherwise. Biophilia is believed to improve human health and wellbeing, social cohesion and attachment to place and hence better place-based outcomes (Andreucci et al., 2021; Downton et al., 2016; Littke, 2016a).

There are multiple approaches to urban greening that both are directly relevant to this research, and that are less so, but nevertheless contribute to the functioning of urban environments and meet the needs of city-dweller requirements. Urban greening projects occur in many forms and on a variety of scales. They can be informal or formal in relation to their implementation. They can be represented as an actual project or representative of a policy. Often urban greening initiatives are individual projects, which may or may not feed into a larger set of mechanisms or programs. A planter box, for example (Dominici et al., 2022), as part of a private home, is unlikely to be part of a larger project but might reflect local resident ideals. Yet if scaled to an apartment building (A. Douglas et al., 2021), although still micro-scaled, a planter box could be considered as belonging to a broader decision mechanism, statement or initiative. In her US-based study, Park (2023) examined numerous individual urban greening projects of various types and scales to see how they contributed to the broader landscape and policy outcomes. She found that, for the most part, projects were singular in nature and their contribution to broader policy outcomes was more likely to be incidental rather than a deliberate contribution to scalable urban greening outcomes.

Urban greening is commonly associated with open space provision on various spatial scales. These include a localised scale, such as a pocket park, a community garden, a sporting field or a rewilded area (Boulton et al., 2015; Burgin et al., 2014; Mintz & McManus, 2014; Sweeney et al., 2019). On a broader scale, urban greening may take the form of reserving an area for future generations, such as parkland or natural bushland habitat for species protection (Hoskins, 2003a; Marshall & Corkery, 2011; Zivanovic & Luck, 2016). Other broader initiatives, either spatially, conceptually or as policy, could include increasing the tree canopy (Saldarriaga et al., 2020; Silk, 2020), creating green corridors (Fabos, 2004), green wedges (Buxton & Goodman, 2016), green belts or a network of open space systems (Evans & Freestone, 2009; Fabos, 2004; Tan & Samsudin, 2017).

2.2.4 Park innovation

A further form of urban greening delivery is emerging through less formal processes in response to rapidly densifying environments, particularly overseas. Tactical urbanism or pop-up urbanism as it is sometimes called depending on context, is emerging as not only relevant to this research, but is gaining traction across the place-based movement of retrofitting public space as an economically viable and efficient way of trialling new ideas and which can be removed with relative ease (Jarman & Stratford, 2023; Stevens, Leorke, Dovey et al., 2024; Stevens Leorke, Thai et al., 2024). Tactical urbanism is an action-oriented urban design and planning global movement that is outcome-focused and encompasses small, experimental interventions. These often involve diverse actors converting under-used city spaces into new, alternative park innovations, for either temporary or permanent uses, and are a means of place-based improvements that increase pedestrianisation, place-making, community connection and identity. These can be citizen-led or organisational-led and often involve a diverse range of stakeholders and interventions (Silva, 2016; Stevens, Leorke, Dovey et al., 2024; Yassin, 2019). For example, De Smet and Van Reusel (2018) use an example of tactical urbanism, documenting a Belgian case study involving the illicit planting of a tree in a land area designated as a car park, which led to the formal creation of a park. However, at the time of writing (May 2024), tactical urbanism or pop-up urbanism in Australia was in its infancy, and the vast majority of urban greening and open space initiatives were provided through formal channels. This is not to say that pop-up urbanism had not or was not being successfully used (Flynn & Thorpe, 2021; Mata et al., 2019; Stevens, Leorke, Dovey et al., 2024; Stevens, Leorke, Thai et al., 2024), but comparative to other more traditional processes of public space improvements, it is rare.

Parklets are also a relatively new form of urban greening in comparison to the traditional twentieth century notion of park provision, which were also born from tactical urbanism and have since been adopted around the world, often through more formal means (Bela, 2014; Birdsall, 2013; Brozen & Loukaitou-Sideris, 2013; Kamvasinou, 2024; Littke, 2016b). They can be either temporary or permanent (Stevens, Leorke et al., 2024) and are often associated with extended outdoor dining as compared to their original intent of increasing urban greening. Although not as well utilised in Australia compared to the USA (Stevens & Morley, 2021), they were

popularised throughout the COVID-19 pandemic as government entities and businesses alike scrambled to innovate as a means of coping with social distancing measures (Stevens, Leorke, Dovey et al., 2024). It is predicted that as cities densify, parklets as a form of park innovation are likely to become more prevalent (Campisi et al., 2022).

Similarly, when considering park innovation such as rooftop parks, these are relatively new concepts in Australia comparative to more established cities with higher densification (Irga et al., 2017; Williams, Bathgate et al., 2021; Williams, Rayner & Rayner, 2010). Green roofs are categorised into either intensive or extensive roofs and service both human and biodiverse benefits (Williams et al., 2010). Rooftop parks are commonplace in other parts of the world such as Singapore, where high-density living has been a mark of the cityscape for decades. However, as noted by Li and Du (2024), the majority of green sky gardens as they are often called are owned by private developers across Singapore and Hong Kong. Owing to increasing dwelling density, and limited land supply and topography, Singapore has long adopted a green roof strategy as a means of providing adequate public open space for residence (Hien et al., 2007). At the time of writing (May 2024), Australia did not have a specific green roof strategy in place, although policies were emerging locally throughout the country (Irga et al., 2017; Williams et al., 2021). Research on green roofs in Australia tend to focus on ecological and sustainability benefits of extensive roofing (Fleck et al., 2022; Wooster et al., 2022). This is not to say there are not examples of rooftop parks emerging across Australia as alternative service offerings to open space, however, comparative to other literature they are not well reported through the literature. Just how green rooftop open space offerings are and how well utilised is questionable, particularly for high-density residents (Bolleter et al., 2024).

Furthermore, when considering smart parks, in Australia just as elsewhere around the world, smart technologies are increasingly being used as part of open space initiatives (Addas, 2023; Anguluri & Narayanan, 2017; Gospodini & Manika, 2020; Kim et al., 2020), yet to date, at least in Australia, they are somewhat patchy in their implementation (Dowling et al., 2019) as evidenced by the various case studies within the literature (Maalsen et al., 2018; Rahmat et al., 2020; Steinmetz et al., 2021). This is not unexpected given that smart city technologies are relatively new in

comparison to the legacy of physical built form, therefore it is going to take time for a more strategic approach to filter through the various layers of urban governance and delivery mechanisms and urban form itself (Dowling et al., 2021; Yigitcanlar et al., 2022). For the purposes of this research, smart parks are acknowledged as yet another emerging element within open space planning outcomes, particularly in relation to parks as mitigants against urban heat effects and new water sensitive design elements (Coutts et al., 2013; Radcliffe, 2019; Wong, 2006), as these appear to be one of the more established notions of smart design elements built into open space. However, it is further acknowledged that smart parks offer more than efficiencies in technology, as they are designed to enhance human interactivity with open space, both for daily access and as a means of better open space urban planning outcomes (Anguluri & Narayanan, 2017; Kim et al., 2020) and are only set to increase in their sophistication and delivery outcomes moving forward.

2.2.5 Challenges of open space and urban greening

One of the most common complaints in the literature is how open space is defined, or rather, inconsistently defined or interpreted (Boulton et al., 2018; Bush, 2020; Feltynowski et al., 2018; A. Hunter & Luck, 2015; Plant et al., 2017; Schaeffer & Dissart, 2018; L. Taylor & Hochuli, 2017). For example, L. Taylor and Hochuli (2017) found no consistency in the meaning or terminology of open space. Similarly, Bush (2020) finds a complex, inconsistent and contradictory open space narrative that is splintered, competitive and misunderstood in terms of priority, benefit, function and provision. As discussed further below, this lack of consistency permeates various aspects of open space provision, not the least being how to translate policy into practice or gain a clear picture of actual open space provision across jurisdictions.

The urban greening of public space also has complicated consequences that go beyond the creation or revitalisation of public space to considerations of stewardship (B. Cooke, 2020; B. Cooke et al., 2020; Porter et al., 2020) and the effects of gentrification and beautification that may inadvertently or otherwise further marginalise residents from varying socio-economic and demographic backgrounds (Dooling, 2009; Jelks et al., 2021; Sharifi et al., 2021b; Shaw, 2008). This leads to questions of how urban greening of public space occurs and which voices and values are preferred over others in the creation of those spaces (Mata et al., 2020; Porter et al., 2020; Stafford et al., 2022; Whitten, 2023). As noted in the beginning of this

thesis, questions of how much greenspace is enough to create and/or maintain equity are emergent themes across the literature (J. Byrne & Sipe, 2010; Corkery & Marshall, 2018; Haaland & van Den Bosch, 2015; Hooper et al., 2018; Kabisch et al., 2016).

In their informative Australia-based critique of urban greening and planning practices, Porter et al. (2020) observe the irony of living in cities devoid of nature as a consequence of the violence of the colonial process, given the broad agreement that urban greening practices need to be revived. The value of re-greening cities through various perspectives is also advocated by other scholars (B. Cooke, 2020; B. Cooke et al., 2020; Frantzeskaki et al., 2022; Mata et al., 2020). The idea of regreening cities through nature-based solutions is an emerging theme across the literature.

Andreucci et al. (2021) posit that a challenge facing the greening of cities is the lack of collaboration or understanding between the fields of biophilic design principles, urban planning interventions and specific health and wellbeing outcomes, coupled with a lack of integration between different disciplines. This is similar to other findings across the literature that to understand the value of urban greening initiatives, no matter the scale, be they from a human health outcomes perspective or otherwise, more weight needs to be given to interdisciplinary approaches (Harris et al., 2022; Kent & Thompson, 2012, 2014). Andreucci et al. (2021) explain in reference to biophilic design and policy-making that urban greening initiatives often lack the necessary resources, power, tools or knowledge to collaborate effectively. Consequently, there is little evidence to support the effectiveness of such interventions, particularly in relationship to the goals they are tasked to obtain. This in turn makes it difficult to develop proxy measures of social benefit, as parks are perceived to cost more than they provide in return (Tempesta, 2015). According to a 2016 urban greenspace and health intervention impacts and effectiveness report, more scholarship is needed to ensure greenspace urban interventions are delivered with greater consideration to maximising environmental, social and health benefits, while preventing or reducing potential side effects (WHOE, 2016).

A further challenge facing urban greening projects beyond stewardship, marginalisation or attitudinal barriers as noted above, is that they can yield mixed results in terms of their effectiveness, particularly when considered from a broader spatial network and strategic urban governance perspective. According to Park

(2023), who examined 18 individual urban greening projects across the USA, the unreliability of the separate urban greening projects was due to their variability, the surrounding assets, the level of investment, community engagement and the capacity for interconnectivity. Kabisch (2015) found similar constraints when examining the governance challenges facing urban greening in Berlin. Continual increases in housing density and population pressures, municipal budgetary constraints, loss of expertise owing to staff turnover and lack of awareness of the benefits of urban greening and sustainability among different stakeholders all combined to cause sub-optimal urban greening outcomes.

Colding et al. (2020) found budgetary constraints, governance challenges related to economic efficiencies, lack of long-term spatial planning and various forms of community use, and under-use all contributed to greenspace degradation and were linked to less optimal greenspace provision outcomes overall. Matsler et al. (2021) found in their review of greenspace definitions that urban greening and open space projects are unreliable and unpredictable in delivering promised outcomes when implemented, particularly if multiple benefits are promised. These shortcomings can also be explained by the increasing expectations placed upon open space to carry more of the human made burden but with ever-decreasing resources and literal allotment of space afforded to the service provision (Boulton et al., 2018; Bush, 2020; J. Byrne & Sipe, 2010; Haaland & van Den Bosch, 2015; Handson et al., 2019; Y. Hsu et al., 2022).

2.3 Valuing the economic benefits of parks

The difficulty and subsequent incidental solutions to measuring the benefits of open space in economic terms can be traced through their origins as a non-market good. Parks were originally introduced into the public sphere as a way of solving increasing social and public health problems brought about by the unforeseen consequences of the industrial revolution such as rapid population growth, urban density and strain on city infrastructures. Parks were proposed to combat delinquency and child safety concerns, create aspiration, amusement, respite and a form of appropriate relaxation for the influx of city-dwellers, as a promoter for clean air owing to the increased industrial activity, and to symbolise the Victorian ideals of parks providing the romantic ambience of country scenes in a city context and

asserting of moral superiority (Cranz & Boland, 2004). These are not dissimilar ideals to those of modern society, all be it couched in the phrasing of liveability and sustainability as parks have evolved (Cranz & Boland, 2004). Crompton explains that although the social motives behind the original parks movement in the nineteenth century originated as a physical indicator of moral superiority imposed on urban citizenship as a form of control disguised as a public benefit, he concentrates on what he terms the single consistency throughout their origin and subsequent evolution and discourse through to the present – that being the generative effect of the proximate principle. This is a term derived to mean the phenomena whereby the increased home values relational to a park's proximity represent a 'capitalisation' of a park's value to nearby homeowners and subsequent housing value (Crompton, 2006, 2007).

Using the proximate principle as a tool for measuring the quality of an urban park based on a willingness to pay has since become commonplace across the literature (Bolitzer & Netusil, 2000; Brander & Koetse, 2011; Crompton, 2001, 2005; Herath et al., 2015). Brander and Koetse (2011) are quick to caution against cross-regional comparisons regarding the proximate principle, but they find as part of their meta-analysis study of open space across differing regions, particularly within the USA, and to a lesser extent internationally, that while open space, specifically local parks, are considered of higher value both hedonically and contingently, their value increases in parallel to increased densification. Although other studies caution that densification is not an exact science, and the value of parks also depends on the quality of their amenity and surrounds such as safety, welcomeness and tidiness (Kimpton et al., 2017; Konijnendijk et al., 2013; Troy & Grove, 2008).

Given the key problem identified in the literature is the difficulty of assigning an accurate value to a non-excludable good such as a park, because parks are not a perfect good, the economic models to measure them are inefficient and the solutions can be problematic (R. Baker & Ruting, 2014; Choumert & Salanié, 2008). Goods can be categorised in many ways. One of the most common distinctions is based on the characteristics of excludability and rivalrousness, namely, whether people can be prevented from consuming them (excludability) and whether individuals can consume them without affecting their availability to other individuals (rivalrousness) (Zeder, 2020).

According to R. Baker and Ruting (2014), cost-benefit analysis frameworks are the preferred means of measuring infrastructure requirements across all levels of government because they provide a consistent means of evaluating market benefits to the community. However, a challenge arises when infrastructure or amenities estimates do not fit into a traditional cost-benefit analysis framework owing to their social benefits (often referred to in this context as non-market benefits) and the difficulty of imposing user charges (excluding people from consuming the good unless they pay). R. Baker and Ruting (2014) continue by noting there are several means of estimating non-market benefits, the most popular being either the revealed preference method or the stated preference method. However, they found that both the revealed preference and the stated preference method were not without flaws and required a great deal of expertise to be understood and applied properly.

R. Baker and Ruting (2014) put forward three main improvements that need to be applied to the cost-benefit analysis framework to evaluate non-market benefits more accurately and thus create better outcomes:

1. Pay greater attention to the quality of existing and future studies and develop a more widespread understanding of what constitutes a high-quality study.
2. Align research into non-market valuation more closely with policy needs, including building up a bank of value estimates to support benefit transfer.
3. Develop greater knowledge about non-market valuation within the relevant government agencies.

As noted above, local parks are differentiated from other infrastructure types by their original intended design as public benefits that are not directly priced, which is what makes them more difficult to evaluate inside traditional frameworks of direct cost/benefit analysis. Unlike other infrastructure, such as roads, cycleways, footpaths, or bus stops, which provide a quantifiable direct economic benefit back to society, the value of local parks is considered harder to measure, which is why other means of measurement that go beyond the proximate principle, or cost benefit analysis are therefore also important. As noted throughout this thesis, increasingly scholars attempt to quantify and qualify the benefits of local parks through various indicators and conceptual frameworks such as liveability, walkability, individual human health and wellbeing outcomes, spatial dispersion, ecology and sustainability (Astell-Burt & Feng, 2015; Bush et al., 2021; Lowe et al., 2020; Pakzad et al., 2017;

Veal, 2020). All of which although not directly costed in the same way of hedonic analysis or a cost benefit framework, have different metrics and values, and thereby contribute to the ultimate savings and spendings created by open space for the necessity of societal function.

2.4 Research integration into the policy making process

As noted throughout Chapter 1, open space as an undervalued infrastructure is a strong theme that emerges from the literature. A great deal of research recommends that open space be valued as an essential infrastructure asset to a city. This is not to say there is a lack of understanding of urban greenspace and its role in sustainable, liveable and productive communities in an Australian context by policymakers, urban planners, developers and other high-level decision-makers, but rather they each have differing motives and priorities and these can be difficult to reconcile (Boulton et al., 2018; Bush, 2017, 2020; J. Byrne & Sipe, 2010; Farahani & Maller, 2018; Raynor et al., 2018). This is why there are increasingly more calls from stakeholders and high-level decision makers across the public and private sector for more research to support the policy making process and integration of research findings into the policy evidence base (Boulton et al., 2018, 2021; Bush, 2020; Corkery & Marshall, 2018; Hunter et al., 2019; Lin, Thompson et al., 2023; Lowe et al., 2020).

According to Davies and Lafortezza (2017), greenspace provision is under-represented in European planning documents and policies. Bengston et al. (2004) undertook a literature review of public policy instruments in the USA regarding urban sprawl and public open space protection and found that federal intervention was minimal, and the array of state and local documentation, although vast, was not always coordinated to meet policy aims.

These needs are reinforced by a lack of practice-based monitoring and evaluation of greenspace implementation, such as in Singapore where the lack of greenspace planning was largely correlated with a lack of public awareness regarding the benefits of greenspace (Haaland & van Den Bosch, 2015). There are cases whereby research studies regarding the functions, services and contributions of urban greenspace call for the introduction of policies to protect and increase said greenspaces, as well as increased engagement between research and its policy

application (Boulton et al., 2018; Kabisch et al., 2016; Kremer et al., 2016; Mell et al., 2017).

Measuring the value of park provision in ways to ensure it remains sustainable and palatable from a policy/practice perspective, for example, being perceived as valuable by stakeholders, is a challenge. Gabriel (2016) explains that parks as part of the larger green infrastructure discourse (which has appeared over the proceeding decades) is a discourse of convenience predicated on sustainability ideologies as governments attempt to align with current thinking. However, the neo-liberal tendency driving cities is at odds with the traditional meaning of urban nature. Gabriel continues by asserting that parks are no longer treated as nature spaces but are required to be self-supporting constituents of an exercise in commodification and economic productivity.

Increasingly, scholars are working toward finding ways in which urban greening and open space can be valued and subsequently embedded into policy. For example, in a Europe-based study, Hansen et al. (2019) created a set of five indicators for assessing green infrastructure priority and found that interdisciplinary collaboration was more likely to yield better multi-benefit greenspace outcomes. Lawrence et al. (2013), also in a European context, suggested a descriptive rather than prescriptive five-step framework for urban forestry governance, with the intention that a shared language and definition be created as a means of writing and sharing case study research. The researchers concluded that interdisciplinary collaborations were required if better outcomes for urban greenspace and forestry were to be achieved. Norman and Alexandra (2019) recommended providing outcome-focused guidelines or guiding design principles, as these appear more effective than detailed ecosystem services valuation studies in leading to better policy decisions. Alternatively, as noted previously in this thesis, strategies of just green enough are also proposed as a means of reconciling the tensions between creating cities with an appropriate amount of open space as compared to other city-shaping priorities and meeting city-dweller requirements (Hooper et al., 2018).

Bush et al. (2015) analyse Australian greenspace policies concerning their ability to mitigate the urban heat island effect, finding that greater collaboration is required across administrative jurisdictions regarding urban greening if we are to future-proof our cities against climate change. Similar findings were reported across

other jurisdictions regarding greater collaboration required to implement greenspace policy and means of managing greenspace provision (Davies & Lafortezza, 2017; Hansen et al., 2023; Mathers et al., 2015). In Australia, Lowe et al. (2020) suggest a series of short-term, medium-term and long-term spatial indicators for liveability (including greenspace provision) could be established as a means of meeting metropolitan policy targets.

One explanation for the lack of priority traditionally afforded to local park provision involves the complexities and overlapping contradictions of green infrastructure functions, designs, trade-offs, and economic considerations (Bush, 2020; Norman & Alexandra, 2019; Plant et al., 2017). Plant et al. (2017) suggest that measuring urban greenspace in Australia is problematic due to inconsistent definitions, frameworks, data metrics between states and the use of indicators. They argue that owing to a lack of a national framework for measuring urban greenspace, and the definitions assigned to urban greenspace across industries and sectors differ, it is difficult to quantify and qualify both the benefits and limitations regarding greenspace provision let alone form a true and accurate picture of greenspace uses, functions and comparisons across Australia. These findings are not dissimilar to Lowe et al. (2020) in their examination of policy, or those of Barnett et al. (2005) in their largely Melbourne based study examining the importance of connecting people and nature through urban greenspace networks.

J. Byrne et al. (2010) argue that one of the weaknesses facing the governance of park space in Australia is that to date there is a tendency toward a siloed approach, informing, guiding, and ultimately affecting the relational infrastructure of parkspace. Similarly, Bush (2020) finds that there are several constraints on the ability of local councils to successfully implement greenspace provision policy. Firstly, there is a tendency for policymakers, advocates, and stakeholders to take a siloed approach to greenspace, defined by the focus of their disciplinary fields, and to exclude other greenspace functions and forms from their purview. This can lead to a prescriptive approach that does not encourage a deeper understanding of the divergent approaches to, and requirements of, greenspace provision. Secondly, inconsistent or contradictory greenspace policies, within or between jurisdictions, and a lack of evaluation of greenspace policy implementation beyond annual reporting requirements, emerged as challenges to local greenspace provision priorities and

broader metropolitan greenspace provision ideals. In their article examining pathways to foregrounding nature in Australian cities, Frantzeskaki et al. (2022) find that urban planning has the capacity to reprioritise urban green infrastructure by transforming planning instruments, including how urban parks, zoning and urban development are managed, and importantly, how new planning tools are implemented into current processes. This is not dissimilar to other research findings that similarly call for a reprioritisation of urban greening in Australia (Bush, 2020; Bush & Doyon, 2019; Corkery & Marshall, 2018; Hunter et al., 2019; Searle, 2011).

Furthermore, according to scholars, the ambiguity surrounding greenspace as an easily defined amenity is further compounded when considering who holds jurisdictional responsibility for the various aspects involved in supplying ongoing maintenance costs and resources. This is fuelled by long-standing tensions between different government organisations, advocacy groups and other stakeholders (Butt et al., 2021; Fingland, 2015; Kubler, 2005; Kubler & Randolph, 2007; Lin et al., 2019). This is not dissimilar to other research findings that similarly call for a reprioritisation of urban greening in Australia (Bush, 2020; Bush & Doyon, 2019; Corkery & Marshall, 2018; Hunter et al., 2019; Searle, 2011).

Whether planning research and planning practice are compatible in the transfer of knowledge and implementation of ideas is increasingly being asked by scholars and urban planning professionals alike, as the role of urban planning research in real-world scenarios is questioned for its efficacy (Goodman et al., 2022; Hurley et al., 2016; Krizek et al., 2009; Lin et al., 2019; Porter, 2015; E. Taylor & Hurley, 2016). A challenge facing Australian urban planning is how research is engaged by urban planning professionals. According to Goodman et al. (2022), the commonality between urban planning researchers and urban planning professionals is each wants to see the betterment of the future of cities, yet they approach it from opposite angles. Hurley et al. (2016) found in their study examining the relationships between urban planning research and urban planning professional practice, that one of the barriers facing the transfer of knowledge between research output and urban planning professional practice from an Australia-based practitioner perspective is the political contexts of decision making. Urban planners may value research outputs, and engage with them if they are succinct, functional, and relatable, but are often

hindered by the gap between research theory and planning practice relational to political will, community demand, reporting frameworks, and/or market drivers.

Opportunities to connect were also seen as a challenge facing the intersection between urban planning research and urban planning professional practices (Goodman et al., 2022; Hurley et al., 2016; Krizek, 2009). This is not to say that scholars and urban planning professionals alike are not working together in an attempt to bridge the gap between academia and urban planning, rather it acknowledges once again the difficulties in translating theory into practice.

2.4.1 Community engagement, policy and parks

Community expectation for open space provision and the capacity for government entities to deliver is an ongoing dilemma for government entities from both policy and resource allocation including funding and actual land availability. For example, Boulton et al. (2021) found that acquiring existing land for park provision was highly contentious, creating tension between what the community needed and what the community was willing to allow. In turn, this placed the local council in the difficult position of how to provide new parks with limited land supply, limited funding and community resistance, yet still meet open space standards and local resident needs.

The tension between community expectation of open space and government entities capacity to deliver is common (Boulton et al., 2019, 2021; Bunker et al., 2017). According to several scholars, there is a divergence between community understanding of their ability to influence and drive project-based outcomes in a local area context and the realities of council responsibilities to legislation and other jurisdictional parameters (Boulton et al., 2022; Osborne et al., 2021; Stewart & Lithgow, 2015). This is not to say that community demand or engagement is not an influential factor in park provision on a local council level, as there is plenty of evidence to suggest otherwise (Bush & Doyon, 2017; Christensen, 2018; Osborne et al., 2021; Stewart & Lithgow, 2015).

However, there are also instances where policy creates inadvertent problems through the very solutions it is attempting to provide. For example, according to Burgin et al. (2014), government policy and guidelines that encourage healthy active lifestyles may inadvertently overburden active open space, which in turn creates

more pressure on local councils to provide further open space, but with limited land supply and limited fiscal resources to meet community demand.

Furthermore, how the community is engaged with by government entities, and how the community want to be engaged with by government entities, be it social media or alternative methods, in relation to urban planning and by extension open space provision, is another source of tension experienced by stakeholders (Osborne et al. (2021). In short, government entities have a problem in relation to community engagement, whereby it is largely seen as tokenistic, elitist and irrelevant (Legacy, 2012; Mahjabeen, 2009). For example, Ruming (2019) found, in an examination of public perception and involvement with strategic metropolitan planning in Australia, that while a significant proportion of the population were aware of strategic plans, only a small proportion of the population were likely to get involved with community feedback mechanisms of these plans, and of those who were likely to get involved, they were more likely to be from higher socio-demographic areas and have the means and capacity to influence outcomes. This is a familiar finding in the Sydney context (Farid Uddin & Piracha, 2023; Uddin et al., 2022; Williamson & Ruming, 2020).

On a more localised level, and specifically in relation to open space provision, scholars report that if meaningful co-designing with the community takes place, it appears to be the most successful method of creating open space provision that meets community need (George, 2022; Lin, Thompson et al., 2023; Naserisafavi et al., 2022). However, in order for this to occur, it has to go beyond traditional top-down methods of information dispersion (Heaselgrave and Simmons, 2016; Sharif et al., 2016; Williamson & Ruming, 2020), surveys or workshops, and become an ongoing exercise in the exchange of ideas that privileges community voices alongside scientific and quantifiable data in order for the best outcomes to be achieved (Whitten, 2023).

2.5 The provision of parks in densifying environments

As noted throughout this thesis, cities are densifying, thus open space provision to meet city-dweller needs is an important topic for consideration. What is concerning throughout the academic literature is the disconnect between housing density aspirations and park provision, particularly when examining the effects of urban

consolidation (Beer et al., 2003; Boulton et al., 2018; J. Byrne & Sipe, 2010; Haaland & van Den Bosch, 2015), a disconnect that according to scholars can lead to park inequity (Kimpton, 2017; Searle, 2011).

Fuller and Gaston (2009), in their European based study, document a dramatic decrease in per capita green space provision in cities with higher population densities owing to more people being packed into urban environments. As they explain, this in turn creates a compound effect of urban impaction on open space, resulting in an over burdening of the amenity. This in turn thereby diminishes the capacity of open space to service essential biodiverse sustainability requirements and city-dweller needs. They continue by acknowledging while there are advantages to the compact city model, including economic efficiencies and resources, noting that of course urban growth is inevitable, compact city discourse and implementation comes at a cost to the quality and quantity of open space provision. Therefore, more innovative means of supplying amenity are going to have to be considered if people are to have any kind of meaningful relationship with nature.

Fuller and Gaston (2009) further assert that as far as societal function is considered, quality and appropriate open space provision along with park innovation are a must if liveability, as well as sustainability, are to be accounted for moving forward. This is a finding repeatedly found across the literature when considering open space and increasing urban density (Boulton et al., 2018; J. Byrne et al., 2010; Hansen et al., 2019; Jim, 2004).

Colding et al. (2020) take a different approach when assessing open space provision against urban densification. They caution against relying on urban parks as the primary source of greenspace provision in the face of rapid urbanisation, as this may be counterintuitive to urban planning aspirations of resilient, sustainable cities, particularly for biodiverse benefits that rely on greenspace at particular types and scales that are counter to city/social aspirations.

Alternatively, several scholars point out that although backyards in detached houses are private greenspace, making them a substitute for open space, they do not negate the need for adequate park provision (Bush, 2020; Coolen & Meesters, 2012; Handson et al., 2019). As Coolen and Meesters (2012) explained in their Netherlands-based study examining the different perceptions assigned to private and public greenspace by local residents, they are different and serve different purposes

in local residents' lives. Thus, to directly substitute private greenspace for public greenspace is not possible, despite the fact that policy documents around the world insist on it as a solution to urban densification. Ambrey and Fleming (2014) found different reasons for caution when substituting private greenspace for public greenspace in high-density areas as a trade-off for the convenience of compact city form. Based on their examination of life satisfaction in Australia in relation to nearby greenspace provision, they found that overall, people who lived closer to and have access to greenspace tended to report being happier than people who did not have adequate access to nearby greenspace provision. Furthermore, they found there was no direct correlation when high-density living was taken into consideration and other variables such as demographics, or socio-economic status were controlled for.

This is not to say there are not successful innovations where land has been repurposed as a way of providing newer relatively large tracts of open space in rapidly densifying environments that go beyond already established parklands such as Central Park in New York or Hyde Park in London. Examples of successful urban greening innovations that go beyond the nineteenth and twentieth century notion of traditional park that are linked with larger land parcels, tourism and economics, are found across the world, including the New York Highline (Lang & Rothenberg, 2017), the redevelopment of the Cheong Gye Cheon freeway into a linear park in Seoul, South Korea (Cervero, 2010; Kang & Cervero, 2009), and the creation of the superblock in Barcelona (Mueller et al., 2020; Rueda, 2019), all of which make interesting case studies from which cities such as Sydney can surely learn.

2.5.1 The inequity of parks

Household income and access to parks have been invariably studied around the world as an influencing factor in city-shaping and land-use patterning including the USA (Browning & Rigolon, 2018), Europe (Hoffimann et al., 2017; Wüstemann et al., 2017), the UK (Ferguson et al., 2018), Singapore (Tan & Samsudin, 2017) and Australia (Astell-Burt et al., 2014; Sharifi et al., 2021a; D. Wang et al., 2015). There is a great deal of research regarding park inequity in an international context, whereby access to park provision based on socio-economic characteristics is often coupled with race and ethnicity (Bruton & Floyd, 2014; Rigolon et al., 2018). For example, Bruton and Floyd (2014) found in a study of 21 parks across a range of socially diverse areas in Greensboro, North Carolina, using physical and natural equity, racial

diversity, income and health criteria, that areas with greater proportions of ethnic minorities and lower incomes had less health, wellbeing and safety promoting amenity than higher-income areas. Other scholars have found similar results when examining greenspace distribution and amenity across differing socio-economic areas and divisions (Dai, 2011; Rigolon, 2016; Rigolon et al., 2018; Sister et al., 2010; Swapan et al., 2024).

Ferguson et al. (2018) found that, based on a study of the city of Bradford in the UK, open space accessibility is related to high socio-economic neighbourhoods, although it did depend on the indicators used as to how equity was affected. Mears et al. (2019) who contests that urban parks are built on Victorian ideals of health measures, found that while neighbourhoods with lower socio-economic outcomes had more parks, they were of lesser quality, located in poorer neighbourhoods and prone to overcrowding. A similar finding was reported by Heo, Nori et al. (2021) in a South Korean study, whereby areas of lower socio-economic outcomes had more access to parks, yet quality of parks in lower socio-economic areas was not as high compared to higher socio-economic areas. However, there is also a growing body of research that cautions against sweeping conclusions regarding park inequity, suggesting that findings regarding access to parks vary depending on the use of indicators (Mushangwe et al., 2021; Semenzato et al., 2023; L. Zhang & Tan, 2019). For example, Corley et al. (2018) assembled a set of indicators to define quality, but with limited success, positing that more needs to be done to reach a consensus on how park quality could be measured. Kimpton (2017) created a series of 12 indicators based on different greenspace types to measure access and inequity in relation to park provision in Australia, also illustrating how different indicators yield different results.

Thematically what emerges across the literature is that in Australia, park provision is not as inextricably linked to household income or other socio-demographic differentiators. Where disparities do occur, they are minor compared to those found elsewhere and are more likely to be associated with health outcomes and park visitation (Crawford et al., 2008; Giles-Corti & Donovan, 2002; Shanahan et al., 2015; J. Smith et al., 2022; D. Wang, 2015). This is to say, there is a larger body of internationally based literature as noted above, that reports more acute inequities

of lower socio-demographic features as having a stronger and more well documented influence on park provision (Rigolon, 2016).

Nonetheless, when Astell-Burt et al. (2014) applied a national lens to examine the distribution of greenspace equity in Australian cities, they found that, although each city's open space equity provision across socio-economic neighbourhoods differed only slightly, the neighbourhoods that were considered disadvantaged had less access to open space than their more affluent counterparts. Similarly, when examining playspace amenity, Anderson et al. (2014) found in their analysis of shade cover in playgrounds across Sydney that lower socio-economic areas were less likely to have shade cover than higher socio-economic areas.

A further challenge related to open space equity is that of perception. The literature also shows there can be a disparity between actual open space provision and the perception of open space. It may not be that lower socio-economic neighbourhoods have less open space than higher socio-economic neighbourhoods as such, but rather the perceptions of that open space are more negative and the open space is either not used (A. Jones et al., 2009) or not well kept. One reason for this anomaly could be that low-income councils may lack the resources to maintain open space well. One of the key findings in D. Wang's 2015 Brisbane-based thesis was that perception of parks is more important than accessibility to them. More affluent neighbourhoods have a more positive view of parks and better access to them in the first place, both perceived and actual (D. Wang, 2015). This speaks to a complex set of intertwined drivers, experiences and urban form that are beyond the scope of this research. However, as noted throughout this thesis there are links between health equity, parks and lower socio-demographic populations, yet these are not always clear. For example, Chong et al. (2013) found that particular demographics in certain contexts recorded a higher level of health related to greenspace. There was also a significant statistical disparity between low socio-economic areas, parkland percentage, and psychological distress.

2.6 Park provision standards and measures

Measuring access to parks is somewhat of a contentious topic. Although set up with good intent, based off the lessons learned through the industrial age and subsequent continued urban densification, as an assurance that open space as a

minimal service would be provided to suit city-dweller needs, a series of open space standards/ratios were set up (Hooper et al., 2018; Turner, 1992; Veal, 2013; Wilkinson, 1988). Common spatial dimension measures used to calculate the appropriate provision of urban parks are hectares per person, also known as population ratio standard, land percentage designation, and distance to urban park, also known as a catchment area or container concept (Hooper et al., 2018; La Rosa, 2014; Veal, 2013; Villanueva et al., 2015; Zhang et al., 2011). Increasingly, catchment-based models, or demand-based models, are being called upon and implemented as an alternative to the one-size-fits-all approach of either a population ratio standard or land percentage-based standard (Veal, 2013, 2020). The framework for measuring adequate public open space as part of the Sustainable Development Goals uses a land percentage standard. Veal (2013) suggests the area percentage and catchment area formats are variations on the population-ratio format when population density is considered. Veal (2013) continues by suggesting in his examination of the history of public open space standards in Australia, that although public open space standards have long been criticised in Australia, and their origin is dubious, they are continually used by planners and policymakers as a starting point if nothing else.

Open space standards are measured differently around the world (Baycan-Levent & Nijkamp, 2009; Chae et al., 2014; Hooper et al., 2018; Y. Hsu et al., 2022; Maruani & Amit-Cohen, 2007). Therefore, it is hardly surprising with all the different interpretations of open space standards in a bid to make them fit into a diverse set of ever evolving urban characteristics, that according to Veal (2013), open space standards are greatly misinterpreted which now results in far-reaching misconceptions and implementation problems that pervade urban planning today.

Several scholars other than Veal (2013) have traced the evolution of the respective open space standards. Turner (1992), in his UK-based study, examined the evolution of open space standards in the UK from the 1940s through to the 1990s and documented the iteration from a green belt based on a population-based standard through to the idea of the green web and catchment-based standards that were more focused on quality. Wilkinson (1985) traced the history of open space standards through the Global North and found that although standards are still the

best means of providing open space, they are problematic in terms of how they are applied, particularly at a municipal level.

This is a sentiment previously shared by Wilkinson (1988). However, Veal (2013) also notes, in reference to NSW Australia, that where the population open space standard came from is unknowable beyond vague references to international standards, hearsay and baseless assumptions across policy documents.

As noted throughout this thesis, there are calls across the research for more sophisticated approaches to open space standards, measurement and understanding to the functionality of daily living (Byrne et al., 2010; Corley et al., 2018; Moseley et al., 2013; Veal, 2020; S. Wang et al., 2021). Scholars have posited various solutions in a bid to accurately assess spatial allocation and uses of parks with varying success. However, given the innumerable variables involved with assessing the dispersion, use or non-use of parks as a public benefit, the challenges and solutions are almost endless. For example, Moseley et al. (2013) proposed a green network that takes into consideration the quality, type and facility of parks as part of the access measurement provision.

Ståhle (2010) recommends what is termed a place syntax model. This combines two approaches to measuring greenspace access, space syntax and geographic accessibility of open space, to provide a more comprehensive resource of parks, particularly in high-density areas, compared to standard measurements. In their systematic evaluation of the most common protocols of non-spatial measurements of parks, S. Chen et al. (2020) found that traditional measures of park provision are either spatial or physical and relate to park proximity, access and size. They found that non-spatial measurements of parks were likely to be linked to park quality, park use or park benefit. Other scholars echo a similar finding, asserting that both spatial and non-spatial benefits are combined for the value of parks to the community in order to be understood (Astell-Burt et al., 2014; Kimpton, 2017; Moseley et al., 2013; D. Wang et al., 2015).

X. Zhang et al. (2011) proposed in their study examining spatial access to parks that a population-weighted distance measure approach was a more realistic measure of park access. They reasoned that this approach calculates results based on the idea that local residents are more likely to use nearby smaller parks, whereas city-dwellers from further afield are likely to use larger parks with more facilities. However,

S. Wang et al. (2021), in their article examining spatial measures for park access, found it was unrealistic, for example, to expect local residents to use the nearest park exclusively, as people's motivations for park use, such as aesthetic enjoyment, facility requirements and willingness to travel, differ.

Open space standards are not without their limitations. For example, Veal (2020) evaluated the catchment-based standard and on-demand planning models. His article demonstrates how the catchment-based standard can be calculated to correlate with the traditional approaches of population ratio standards, which specify the area of open space per hectare required per 1000 population, or area-percentage standards, which specify the percentage of land that should be reserved for open space-based on residential land calculations. He continues by explaining that population ratio or land-ratio standards have an equivalent consequence that result in opposite problems. For example, if the population ratio standard within an allotted area remains the same, yet the population increases to above the threshold density of 353 persons per hectare (ha), 100% of the area is then required for open space to meet the standard. Whereas, if the land-percentage ratio remains the same within a given area even when housing density increases (which can lead to overcrowding), open space per capita falls as a result. Veal (2020) further states, the premise of the demand-based model for open space is based on the estimated unmet or future growth in demand for recreation opportunities, which in turn are based on predicted population density and subsequent housing demand.

Similarly, X. Zhang et al. (2011) explain that distance-to-park measures, also referred to as the container concept, as a summary of the number of parks, or the total area of parks within a given geographic area, such as an LGA, or a defined (i.e., average) walking distance from housing also have their limitations. Zhang continues, the spatial accessibility of parks may vary depending on the geographic containers, which can lead to a degree of unreliability if not considered in a broader context. For example, LGAs could have inconsistent park accessibility measures depending on the size of the geographic container, such as 400m or 800m from a given residence, and the differences in access modes between compact inner-city locations and car-dependent outer-suburb locations. Further, larger geographic containers may result in a serious ecological fallacy problem, that every individual in a suburb has the same spatial access to parks. A further challenge when considering a container approach

is edge effects. For example, a suburb or LGA may have a shortage of parks inside the allotted jurisdictional or measurement zone but may have access to parks outside the boundary, yet those parks beyond the boundary are assumed to be inaccessible. However, other scholars argue to consider access to open space from a context that is too broad creates a set of different problems that can lead to data bias and open space inequity (Evans, 2019; Y. Hsu et al., 2022).

This is not to say that traditional open space standards are without merit. The value of local park spatial placement as part of a wider network, and the efficiency of urban parks as multi-functional units of amenity is increasingly being called upon by scholars as a necessity for the future sustainability of cities. Measuring access to urban parks is an important means of establishing the health of a city (Namazi et al., 2012). Kendal et al. (2016) suggest in their review of the benefits of urban greenspace across Australia, there is comparatively little research on the correlates and thresholds of urban greenspace provision. Despite this, distance to greenspace is proving to be a valued predictor of greenspace use, perceptions of wellbeing, and a range of health benefits. Hooper et al. (2018) somewhat agree with Kendal et al. (2016), citing a lack of research into access to local parks from a standards viewpoint, but they also differ, suggesting too little is known about how public open space standards are implemented in practice to draw conclusions on distance as a correlation, and that based on their examination of public open space standards as compared to public open space provision policies across Australia, the alignment between public open space standards and practice is fragmented, especially when considering health outcomes.

Furthermore, the spatial accessibility of local parks, mainly based on proximity, location, and size, is often used to evaluate the contribution of urban parks to physical activity in many studies (Chong et al., 2017; Giles-Corti et al., 2005; Robinson & Breed, 2019). According to Zhang et al. (2011), From a public health intervention perspective, spatial accessibility of local parks lays the foundation to inform and evaluate further requirements for new local park provision or existing local park upkeep improvement in relation to local park amenity, characteristics, and function.

2.7 The impacts of the COVID-19 pandemic on park provision

On March 11, 2020, the World Health Organisation (WHO) announced the world was experiencing a pandemic (WHO, 2020). This is commonly known as coronavirus disease (COVID-19). Owing to the timing of this thesis, which largely took place throughout the pandemic and the influence the pandemic had on the recruitment of suitable participants, as noted in Section 3.6.2; “Recruitment context and limitations”, it is only fitting that it is touched upon in relation to the literature surrounding open space provision that has been produced as a result.

The pandemic did not change the world of park provision. Around the world the pandemic was a disrupter to society on every level (M. Cook et al., 2020; Kang et al., 2020). Parks came to the forefront of city dwellers’ minds and lives as people flocked to them for respite from localised lockdown measures (Ugolini et al., 2020). Park provision took on new meaning in Sydney, as it did elsewhere in Australia. Traditionally considered recreational spaces, predominantly for children and, possibly, fleeting daily commutes, parks during the pandemic attracted an increasingly diverse demographic, highlighting the value and role of parks for local communities (Astell-Burt & Feng, 2021; Berdejo-Espinola et al., 2021; Lin, Chang et al., 2023).

History suggests this will not be the last time we use parks as a panacea for urban de-stressing or to improve public health (K. Jones, 2022). For the first time in history since the 1919 outbreak of the Spanish Flu, the outbreak of disease affected the population on a global scale and was not restricted to a geographical pocket or population demographic such as disease outbreaks of the past (Frumkin, 2021; Kang et al., 2020).

In the early days of the pandemic, when everything about the pandemic, and the use, or rather the non-use, of public space felt foreign, some scholars were optimistic about how public space, including park provision would be transformed for the better (Honey-Rosés et al., 2021; Nieuwenhuijsen et al., 2021), whereas other scholars were far more sceptical, predicting that if meaningful change were to occur, it would depend on how long the pandemic lasted (Florida et al., 2021). Obviously with the power of hindsight, it is clear that little has changed in relation to public

space or park provision as a result of the pandemic. However, the pandemic served to reignite and at least for a time repopularise the debates on almost every aspect of urban park provision. This included the role of urban planning in healthy city discourse, inequities of park provision, the benefits of open space to human health and wellbeing, the size and quality of open space to serve city-dweller requirements in times of crisis, the role of open space in compact cities and the design of future open space provision as a future-proofing mechanism for the next pandemic (Allam & Jones, 2020; Berdejo-Espinola et al., 2021; Bolleter, Edwards, Cameron et al., 2022; Honey-Rosés et al., 2021; McFarlane, 2021). This is seen throughout the upsurge in literature that explored the relevance, importance, challenges, access, and uses of greenspace (Dobson, 2021; I. Douglas et al., 2020; Kleinschroth & Kowarik, 2020; Nieuwenhuijsen, 2021; Ugolini et al., 2020; Venter et al., 2020).

A prominent theme to emerge from the research was that of open space heralding a panacea for the current adverse secondary human-health effects caused by the pandemic and the consequences of lockdown measures and health orders implemented around the world (Kleinschroth & Kowarik, 2020; Nieuwenhuijsen, 2021; Slater et al., 2020). Conversely, other research questioned the greenspace cure all sentiment, noting that the pandemic and societal changes therein were more complex than what fresh air and nature could provide. For example, Witten (2020) argued that viewing greenspace through the traditional lens of a public health solution, as has been done since Victorian times, was an overly narrow perspective. Similarly, Lee and Maheswaran (2011) doubted the efficacy of health outcomes touted in greenspace research. Pan et al. (2021) stated that a more contextualised approach to the effectiveness of greenspace as a mitigator of the pandemic effects was required. Frumkin (2021), in a broad examination of the history of disease outbreaks across the world, notes that cities are simultaneously affecters of pandemics and responders to pandemics. They observe that disease has, and will continue to, influence the built environment in a myriad of ways, and that in this regard, COVID-19 is far from unique (Frumkin, 2021).

Throughout the pandemic, the measurement focus on park provision shifted to include not only the known socio-economic disparities of park provision, such as those predating the pandemic (Dai, 2011; Rigolon, 2016; Rigolon et al., 2018; Sister et al., 2010), but to how existing disparities affected the degree to which populations

could access parks as a result of lockdown measures and other public health concerns directly related to COVID-19 (Astell-Burt & Feng, 2021; Geng et al., 2021; Hoover & Lim, 2021; Larson et al., 2021; Pallathadka et al., 2021; Uchiyama & Kohsaka, 2020). Research indicates that lower socio-economic groups were affected more adversely by the pandemic and had less access to parks than higher socio-economic groups (Larson et al., 2021; Pallathadka et al., 2021). As stated previously, this is an unsurprising finding considering previous research on the topic and the prevailing tendency worldwide for economic disparities between park access, provision and quality (D. Chen et al., 2022).

From a community access perspective, what became clear throughout the pandemic was the value of private and public greenspace to city-dweller health and wellbeing (Geng et al., 2021; Soga et al., 2021; Ugolini et al., 2020) even though, according to one Canada-based study undertaken in the first three months of the pandemic, city-dweller uptake of parks dropped significantly (Borkenhagen et al., 2023). This can likely be explained by the panicked state of the world due to the escalation of the first wave and the unknowns of the disease. A similar finding was reported in the UK, yet the researchers also reasoned further research throughout the pandemic was warranted to see if user patterning would change (Burnett et al., 2021). In general, increased city-dweller usage of parks was well documented in Australia (Berdejo-Espinola et al., 2021; Spennemann, 2021) and in other places around the world, such as in the USA (Volenec et al., 2021) and the UK (Burnett et al., 2021). What is less clear is whether, as city-dwellers have entered the post-COVID-19 phase, the increased demand for park provision by city-dwellers is permanent (Honey-Rosés et al., 2021). Son et al. (2023), in their two-round Delphi study, predicted that use of open space, specifically parks for local recreation needs, compared to other lifestyle changes brought about by COVID-19, would remain heightened post-pandemic.

Throughout the pandemic, there was a great deal of debate regarding the optimal size of open space provision to service city-dweller needs (Bolleter, Edwards, Cameron et al., 2022; Honey-Rosés et al., 2021; Son et al., 2022; Spennemann, 2021). Some scholars suggested bigger urban parks, such as regional or parklands, were better for urban health outcomes in times of crisis as they allowed for greater social distancing and mitigated the opportunity for overcrowding. Other scholars

suggested that the provision of more local parks closer to where people could access them easily would be more beneficial for urban health outcomes, as the benefits of residents being able to access superior quality greenspace near their dwellings were more beneficial during pandemic times. One reason for the split responses that go beyond planning theory is how different countries handled the pandemic in terms of public health orders and lockdown measures.

Some of the biggest challenges facing urban planning throughout the pandemic were not knowing how long it would continue, what the population ramifications were (Baum et al., 2022), whether public space could support society to function in the longer term and what, if anything, urban planning could do differently given the constraints of legacy space that was not fit for the pandemic requirements of public health outcomes (Honey-Rosés et al., 2021; Pojani & Alidoust, 2021; Spennemann, 2022; Triguero-Mas et al., 2022). Honey-Rosés et al. (2021) theorised that if a pivot toward healthy cities was to occur post-pandemic, it would likely be accompanied by a more serious effort to make cities greener. What this could look like would depend on the outcome of the pandemic, as it could potentially change the type and distribution of greenspace required by city-dwellers on both a local and metropolitan scale. For example, they anticipated greater demand for smaller green spaces or neighbourhood parks as places for respite, while active recreation paths such as running trails or sporting fields would need to be redesigned to accommodate social distancing and to cope with the added influx of users if another pandemic were to take hold.

Many urban planners questioned how city-dwellers could move forward once the COVID-19 crisis was over and what role urban planning would play in the adjustment to the ‘new normal’ (Ahmadpoor & Shahab, 2021; Bolleter, Edward, Cameron et al., 2022; Honey-Rosés et al., 2021; Scott, 2020; Son et al., 2023; Spennemann, 2022; Triguero-Mas et al., 2022). Some urban planners argued urban planning needed to be at the forefront of discourse, policy and urban health into the future. A challenge arises however, as found by Harris et al. (2020) in their Sydney-based pre-pandemic analysis of urban health policy within a strategic planning context, in that urban health was not valued sufficiently highly and was subsequently misinterpreted as a means of creating health precincts rather than healthy environments and absorbed into other priorities. A health precinct is a precinct or

development focused on medical care, such as a hospital and other surrounding amenities as secondary infrastructures, as opposed to healthy built environments that focus on maintaining the health of city-dwellers through active transport innovations, open space and other initiatives that would provide a social return on investment.

Other scholars cited the lack of collaboration between urban planners and public health disciplines as a barrier to the role of urban planning in future-proofing cities against further pandemics (Allam & Jones, 2020). A similar Australian study surveying 'built environment practitioners' in relation to creating healthy places revealed that to a large extent there was a disconnect between urban planners and public health professionals (Morrison et al., 2021).

According to Ibert et al. (2022), the need for spatial planning to diversify and become more resilient, both environmentally and as an urban function, has heightened since the pandemic. Spatial planning needs to become more flexible and prepared for crisis via scenario building, providing alternative and temporary solutions as part of the longer-term forecasting process. The calls for a more flexible and integrated built environment that accounts for a holistic approach to public health is something scholars had been calling for long before the pandemic phase (Kent & Thompson, 2012, 2014). Honey-Rosés et al. (2021) wrote about the possibility of public space being transformed one way or another as a result of the pandemic, yet ultimately, all scholars could do was observe and document the disruption as it unfolded and hopefully translate the learnings into something useful. As cities have emerged into the post-pandemic phase and public health orders, lockdowns and social distancing measures are no longer in place, it can be seen that although pertinent questions at the time were posed by Honey-Rosés et al. (2021) regarding potential scenarios for public space, many of the possibilities for transformation of everyday public space have not come to fruition. It is, once again, business as usual in city streets, plazas, parks, squares and other public spaces. Evidence of the powerlessness of urban planning, particularly in relation to urban greenspace provision as a solution, can be found in Lafortezza and Davies (2023), whose research finds we are quite literally moving away from nature-based solutions and favouring construction as a remedy to the COVID-19 crisis[11].

2.8 Summary of literature

What is clear across the literature is that, regardless of how open space provision is examined, there is a slew of human-centric and biodiversity-based benefits that are essential to the sustainability and functionality of urban environments and that if they are not taken more seriously, the quality of life for city-dwellers will decline. These ideas came to the forefront during the pandemic, when inadequate open space thematically emerged as an influencing factor in the health and wellbeing of citizens across the world during times of crisis. Although the pandemic was an opportune time to re-evaluate the value and priority of open space, relatively little has changed regarding the trajectory of open space provision on a broad scale as a result.

Not all open space is equal, and not all people have equal access to open space. Although not as problematic in Australia as compared to elsewhere in the world, socio-economic and demographic features directly impact the allocation of and access to the provision of open space. In rapidly densifying areas, there is increasingly less land available for greenspace, yet more pressure placed on existing greenspace to carry the impact of human demand. The funding for open space provision is problematic across the world as other infrastructures and neo-capitalist ideals are given priority and the social benefit provided by parks is often viewed as a secondary want when measured against roads and urban growth.

Open space policies are high-level documents that provide guidance regarding greenspace provision, yet translating the aspirations they uphold into practice proves difficult. What is less clear across the literature is how best to manage greenspace provision in a highly competitive environment where resources such as funding, land availability and the social value placed on parks are finite. Open space standards are proving inadequate in rapidly densifying areas. The literature continually argues for more integrated, innovative and place-based outcomes if cities are to remain or in some cases become liveable.

Chapter 3: Methodology

3.1 Introduction

This research explores local authority decision-making environments facilitating the provision of a key element of liveable and healthy cities: parks. The research uses Sydney, Australia, as a case study as first described in Chapter 1. The current chapter is divided into five sections. The first section describes the philosophical underpinnings of the research. The second section describes the secondary and primary data methodologies used to conduct the research including the Delphi study design and considerations. The third section describes the participant recruitment process, including referring to the ethics process and participant data management protocols. The fourth section describes the data analysis tools applied to the findings of this research. The fifth section describes the inclusive practices used in the presentation of this document.

The academic literature reviewed for this research as discussed in Chapter 2, illustrates the various approaches used to examine park provision. Several qualitative methods could have answered the questions in this thesis and provided insight into the barriers and enablers regarding park provision across Sydney as experienced by state and local government planners. Alternative methodological approaches that could have been used to answer the research questions include brainstorming and nominal group technique, as they allow many individual perspectives (McMillan et al., 2016). The Delphi method was chosen owing in part to its appeal to the researcher regarding the symmetry and symbolism between ancient and modern political and urban enquiry as detailed by Marchais-Roubelat and Roubelat (2011). Notwithstanding the poetic, the Delphi method was chosen for its effectiveness in the forecasting and urban development policy space (Perveen et al., 2017), and as an effective tool for exploring complex decision processes, scenarios, and as a forecasting methodology. Lastly, as explained in the current chapter, specific to this case study, the Delphi method offered an efficient and effective means of gathering the opinions of state and local government planners within a set of unique constraints experienced as part of this research.

3.2 Philosophical underpinnings

Drawing on Bryman's explanation of social research as the attempt to understand something that is yet unresolved within society (Bryman, 2016), this research explores the dynamics of government policy, funding, and practice around an increasingly important "public benefit": park provision. As explained below, it uses a critical realist approach, as it is amenable to case study research (Næss, 2015).

The fundamental assumptions of this research were based on philosophical underpinnings that are frequently interrelated and/or dependent on one another (Creswell, 2009; Creswell & Poth, 2016; Krauss, 2005; Rose & Johnson, 2020). Khaldi (2017) stated that research is the acquisition of knowledge in an organised and systematic way based on the philosophical tenets of the researcher. This sentiment is backed up and discussed in greater detail in relation to the Delphi method by Mitroff and Turoff (1975) in their seminal paper on the topic. Krauss (2005) posits that ontology, epistemology and methodology are somewhat co-dependant; ontology necessitates the philosophy of reality, epistemology addresses how we interpret that reality and methodology identifies the practices used to acquire knowledge of said reality.

3.2.1 Ontology

The key ontological assumption underpinning this research is that public policy is a dynamic and constantly evolving landscape driven by social, economic, political and physical changes. Public policy is constrained by the constant reconfiguring of political, economic and social agendas to perpetuate the status quo, despite pressure to change. According to Næss (2015), the philosophical reasoning defining the researcher's ontology is a good fit for urban planning, as it usually includes the possibility of an interdisciplinary crossover of the knowledge, assumptions and flexible validity that urban planning requires to function, be understood and be implemented.

3.2.2 Epistemology

The role of epistemology has been examined throughout the urban planning literature. Examples include aspects of 21st century notions of urbanity (Brenner & Schmid, 2015), planning theory and power relations (Mashhadi Moghadam &

Rafieian, 2019), informal settlements (A. Roy, 2005) and urban morphology (Scheer, 2016). What these scholars have in common is a shared questioning of 'how' we come to the knowledge of planning and how this, in turn, affects urban planning itself, in terms of what is considered important or unimportant. The epistemological considerations of knowing and valuing elements in turn impact how cities are shaped and built (Forester, 1982). Urban epistemology is the examination of categories, methodologies and cartographies related to the shaping of urban life and how these ideas of understanding are situated within urban theory, research and action (Brenner & Schmid, 2015). An important epistemological assumption underpinning this research is that policymakers can explain how decisions are made about scarce resources and how policy priorities shape outcomes in practice.

3.2.3 Inductive reasoning

Inductive reasoning was chosen to undertake this research. In its simplest form, inductive reasoning allows us to generalise from one instance to another, drawing generalisable conclusions from specific evidence (Feeney & Heit, 2007). Inductive reasoning has strengths and weaknesses that must be taken into consideration. Examples include the quality of research questions, the data gathered, participant involvement, and researcher ability (Khaldi, 2017), all of which were considered for this research, and all reasonable mitigative measures put in place.

3.2.4 Critical realism

The research paradigm signals the intent, motivation and expectations for the research (Mackenzie & Knipe, 2006). This research was underpinned by a critical realist paradigm articulated by Næss (2015). One reason for choosing critical realism as the preferred philosophical approach to this research was that critical realism allows distinction between statements of differing credibility (Næss, 2015). Critical realism seeks to bridge the dualism of objectivist or subjectivist approaches and insists there exists a reality independent of what conceptions we may have about that reality (Næss, 2015). Critical realism also provides a degree of flexibility as to what can be considered important within the bounds of the research. According to Gorski (2013), in their article examining the formation of critical realism, it recognises that our ontologies are fallible.

Critical realism lends itself to urban planning as it allows for flexibility of approach and incorporation of methods such as qualitative enquiry and intersectionality, both of which are crucial to examining and establishing urban planning practices. Therefore, a critical realist approach underpinned this research because it allowed for and encouraged a deep understanding of the natural and social structures at play within any given situation (Vincent & O'Mahoney, 2018).

3.3 Study design

Sydney is a rapidly densifying city with clear differences across its footprint regarding topography, socio-economic and demographic features, built and population density, and amenity provision. Sydney also has a long history in shifting multi-level governance and planning reform. Sydney is hemmed in by sea and mountains, therefore continued urban sprawl is not an option. This translates into limited space, growing population, requirements for amenity, and in some areas which are highly developed, there is a lack of land available for adequate open space provision to meet current and future projected population requirements. Understanding planners' perspectives regarding barriers and facilitators of open space provision is an important contribution to the literature, not only immediate to this case study, but to broader challenges related to urbanisation experienced around the world, especially if cities, towns and neighbourhoods are to remain, or in many instances become, liveable and sustainable into the future.

3.3.1 Research questions

There were three questions that guided this research:

1. What are the crucial elements needed for new park provision and how does perception (and availability) of these differ among state and local-level policy-making entities and amongst individuals working with those entities?
2. Do some localities experience sharper deficits and if so, what can be done to address local disadvantage? How would park provision strategies need to be revised?
3. How could deficits be overcome? What strategies have state and local entities developed to increase park provision? Is there any consensus

about the effectiveness of strategies among policy actors at different levels?

3.3.2 Research elements

There are three elements that make up the findings of this research: 1) policy analysis and resource allocation – the results are provided in Chapter 4; 2) current and future modelling park provision – the results are provided in Chapter 5; and 3) planners' perspectives – the results are provided in Chapter 6. The combined outcomes of the data analysis are then discussed in Chapter 7. Chapter 8 provides the findings and a series of recommendations including avenues for further research based on these outcomes.

The first and second elements of this research comprise of secondary data analysis and the third element of this research comprises of primary data analysis. The methodological approaches of each are described below, beginning with the geographical boundaries, followed by an explanation of the secondary data sets and their application, and lastly a description of the primary data collection tools (Delphi and semi-structured interviews).

3.3.3 Geographic entities

Three geographic entities – two primary and one secondary – were used in this research. The first primary geographic entity was the SUA of Sydney as defined by the Census geography (ABS, 2021b). As noted in Section 1.3.4; Definition of a metropolitan area, the case study area for this research was adjusted to align with the contiguously built-up area of Sydney. The secondary data analysis in Chapter 4 and Chapter 5 is based on the defined metropolitan boundaries of Sydney unless specified otherwise.

The second primary geographic entity was the individual local government areas (LGAs) of Sydney, which were used to analyse area-level data from which to make inferences about Sydney. LGAs were chosen because of the political and spatial function they serve and because they work more closely compared to other government organisations such as the Australian Commonwealth or NSW state government entities regarding the implementation and upkeep of new park provisioning based on local capacity, outputs and investment capabilities (LG NSW, 2023). As described throughout the chapter, LGA boundaries were used extensively

throughout the research as a means of secondary data analysis, while using LGA data for analysis ensured the secondary data aligned with the primary data analysis.

The third geographic entity was the five metropolitan planning districts: 1) Western City District; 2) Central City District; 3) South District; (4) Eastern City District; 5) North District. These districts are used in state, regional and local policy documents to guide the decision-making process regarding park provision on various scales. From a NSW state government perspective, they are used as a smaller more localised scale as compared to a metropolitan-wide one, and for local councils they are used as a broader scale that extends beyond the bounds of a local jurisdiction (GSC, 2018a). Specific to this research, they were used for secondary data analysis as a bridging concept between a Sydney wide metropolitan level and the LGA level.

3.3.4 Secondary data

The use of secondary data sets in Chapters 4 and 5, was employed as a means of triangulating the findings from the primary data collection (Delphi and semi-structured interviews). Secondary data sets were from the NSW Department of Planning and Environment and the Office of Local Government as explained below:

Chapter 4 utilised relevant indicators from the Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) to establish proxy values of funding mechanisms for developer contributions aggregated to a local council level for the year 2019-2020. Secondly, NSW Department of Planning and Environment public facing data relating to various individual funding initiatives from across multiple web pages were examined to establish estimated values for NSW state government grants administered to local councils for open space provision over a period of five years between 2018-2023.

Chapter 5 used the NSW Department of Planning and Environment population and dwelling projections data from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) aggregated to a local council level to illustrate the forecast population density, housing demand, and land supply across Sydney between 2022 and 2041. Secondly, relevant indicators from the Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) were applied to a common measure of park provision (population ratio standard of 2.8 hectares

(ha) per 1,000 population) aggregated to a local council level and used to identify where and approximately when park shortfalls would occur between 2022 and 2041.

Data from both the Department of Planning and Environment's population projections and implied housing demand projections are based on common planning assumptions and medium growth scenarios (NSW Treasury, 2023). Population projection data is based on a tool provided by state government and used to inform longer-term future planning for land use, service delivery, infrastructure investment and economic development. Population projections use known new housing supply and infrastructure investments in Greater Sydney to distribute the projected future population across the city. An understanding of the size and composition of the future population of Sydney is therefore essential to informing planning decisions for the future so that appropriate services, such as greenspace provision, are planned and provided.

The Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) used in this research is provided as an indicator only, to illustrate proxy values and differences between local councils across Metropolitan Sydney. The Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) uses a series of benchmarks that are consistent over time and have presumably been run through a series of checks and balances regarding the reporting process and data analysis by the organisation before being released. The data is therefore considered reliable and suitably rigorous as a platform for external commentary[12].

3.3.5 Primary data analysis

This section provides a description of the primary data collection methods (Delphi and semi-structured interviews) and associated considerations and how they were each applied and implemented in this research. Firstly, a discussion of the background of the Delphi method is provided along with the characteristics and limitations of the method. How the Delphi method was applied to this research is also provided, including the risks and mitigations considered. This is followed by an explanation of the Delphi survey design and participation considerations directly used in this research. Secondly, an overview of the semi-structured interview methodology is provided, including its strengths and limitations. This is followed by an explanation

of how semi-structured interviews were applied to this research, and the risks and mitigations put in place to ensure the rigour of the research.

The aim of the Delphi study and semi-structured interviews was to understand the provision of parks across a complex environment such as Sydney from the perspective of NSW state and local government planners and to assess if these differed or remained the same across various built densities or government organisations. The Delphi study and semi-structured interviews combined sought the opinions and perspectives of 17 planners from a range of state government entities and local councils across Sydney, all of whom were directly involved in park provision and were tasked with translating policy into practice. The inclusion of Delphi panel members from the NSW state government and Sydney metropolitan and urban fringe local councils ensured the results reflected the differences in their strategic priorities. The utilisation of both the Delphi method and semi-structured interviews as opposed to preferencing a singular form of data collection over another helped manage the burden of research contribution experienced by participants.

The definition of a planner followed that provided by the Australian Bureau of Statistics in their *Australian and New Zealand Standard Classification of Occupations* (ANZSCO) *unit group: 2326 Urban and Regional Planners* (ABS, 2022). This is similar to the definition used by Fallding and Williams (2023) in their *Planners in Australia: State of the profession report.*

To ensure a more in-depth understanding of park provision across the case study, the Delphi study was extended to include a separate set of semi-structured interviews. Four benefits were identified concerning separating the Delphi study and semi-structured interview components of the research, as follows:

1. Separating the Delphi study and semi-structured interviews allowed for a self-selection geographical characteristic bias within the Delphi study to be addressed and somewhat mitigated.
2. Dividing the Delphi study and semi-structured interviews into separate research phases allowed participants to participate in the research in a medium they preferred. For example, several participants opted for one phase of the research over another, owing to timing, personal preference or to balance project commitments.

3. Separating the Delphi and semi-structured interview phase of the research extended the mode of enquiry, allowed for a variety of data-gathering tools to be used, and provided the opportunity to fill the gaps in the Delphi sample (due to non-response/non-participation). Separating the Delphi study and semi-structured interview phases of the research also mitigated the risk of response fatigue or survey attrition by spreading the workload across NSW government organisations and phases of the research.

Splitting the primary data collection phases of the research further triangulated the findings of the Delphi phase via a different methodology that could also be compared to the broader urban planning literature.

3.4 Delphi background and rationale

The RAND Corporation developed the Delphi method in the 1950s, originally to forecast the impact of technology on warfare. The method entails a group of experts replying anonymously to an initial survey. They then received feedback in the form of a statistical representation of the group response and the process is repeated to reduce the range of responses and arrive at something close to an expert consensus (RAND, 2024). Dalkey and Helmer (1963), who were largely responsible for pioneering the Delphi method in the 1950s and 1960s, are more precise regarding the intended outcome of the Delphi method, suggesting its original intent was to maintain the most reliable version of consensus from a group of experts through an iterative series of intense written surveys and controlled feedback that avoided participant confrontation and encouraged considered responses.

Since its inception, the Delphi method, also referred to as the Delphi approach, has evolved and been adapted to adjust to academic form, technological advancements and the requirements of modern research (Habibi et al., 2014). An evolving trait of the Delphi method is that although it was originally designed as a forecasting tool (Dalkey & Helmer, 1963), it is also commonly used as a facilitation tool. While this research used a conventional Delphi approach according to the RAND definition, the RAND Corporation's original iterative feedback mechanism was modified to generate a series of themes to better explore, reflect and adjust for the multi-layered complexity of park provision across Sydney. Such an expansion on the traditional Delphi method is not unusual (Holey et al., 2007).

The Delphi method has the following characteristics:

1. The Delphi method is a structured communication technique designed to gather expert opinions, judgements or perspectives on a particular topic, scenario or forecasting process.
2. Using a successive iterative process, the Delphi method is designed to collate professional opinion or judgement via a series of surveys and feedback mechanisms that continually inform the process until a sound outcome is reached.
3. The Delphi method is particularly suited to policy development, complex decision processes, futures-building, complex problems or definition consensus.
4. It can also be used to determine or develop a range of possible scenarios or subject-focused alternatives or to explore or expose underlying assumptions or information enabling accepted judgements and/or practices.
5. A Delphi method may be used to seek out information that may generate a consensus, convergence or stability of opinion on behalf of the participant panel to be applied elsewhere.
6. The method can also be used to correlate informed judgements on a specific field of enquiry. The Delphi method can be a valuable tool with which to educate a participant panel via transparent and reflective practices of potentially diverse and interrelated aspects of a topic.

   It is designed to reduce the bias of opinions that may emerge in other settings, provide iterative feedback, inform decision processes and allow for participant autonomy outside of hierarchical bounds.
7. The nature of the Delphi method means that the element of participant anonymity encourages the expression of open and honest opinions without industry politics or power imbalances driving the dynamic, as can happen with alternative methods.
8. The Delphi method creates a dynamic where all opinions are equally weighted. This is because the Delphi surveys are undertaken by

participants individually before the responses are collated by the researcher and redistributed to participants with aggregate findings for further iteration and consideration.

9. The method eliminates from the discussion potential distractions that can occur with alternative methods, such as the group nominal technique, and enables thematic clarity and exchange of information for participants. This in turn allows participants to reflect on their responses and change their opinions, either based on their own reflections or in response to the iterative process, without fear of criticism or reprisal (Belton et al., 2019; Dajani et al., 1979; Hanafin, 2004; C. Hsu & Sandford, 2007; Linstone & Turoff, 1975; Rowe & Wright, 2011).

3.4.1 Delphi limitations

Numerous studies have explored and reviewed the methodological considerations raised in Delphi studies (Beiderbeck et al., 2021; C. Hsu & Sandford, 2007; Landeta, 2006; Linstone & Turoff, 1975; Rowe & Wright, 2011). According to some scholars, the method sometimes lacks academic rigour and validity (Hasson & Keeney, 2011; Paré et al., 2013) due to a lack of consistency in survey preparation, conduct, analysis, and inconsistent definition and usage (De Loë et al., 2016). The literature varies considerably regarding the exact composition of a traditional Delphi approach and how it should be managed. It can also be seen as too flexible and that it is difficult to identify core study design principles (Hasson & Keeney, 2011; C. Hsu & Sandford, 2007; Rowe & Wright, 2011; M. Thompson, 2009).

The literature is divided on how many rounds a Delphi study should be. For example, Dalkey and Helmer (1963) used a five-round survey, with follow up interviews between the first and third rounds. Musa et al. (2015) used two rounds in their Delphi study assessing environmental wellbeing indicators for sustainability. Brady (2015) posits most qualitatively based Delphi studies have three rounds. Gordon (1994) used four rounds in their hypothetical example of what a Delphi method survey should entail. Barrios et al. (2021) compared studies with three rounds.

Similarly, there is just as much debate across the literature regarding what a Delphi consensus should entail. This is frequently represented within a statistical

percentage based on a majority of participant opinion as opposed to the general meaning of ‘agreement’ or ‘unanimity’. The iterative Delphi round process usually ends once an “acceptable level of consensus” has been reached. Several scholars suggest 75% as a reliable figure for consensus representation (Barrios et al., 2021; Belton et al., 2019). However, scholars also concede there is no universally agreed definition of where the cut-off point should be, or what consensus looks like (Barrios et al., 2021; Diamond et al., 2014; Holey et al., 2007). As Barrios et al. (2021) and Diamond et al. (2014) explain it, consensus is one of the most controversial methodological challenges facing the Delphi approach. De Loë et al. (2016) posit that the aim of a Delphi study is to elicit a stability of responses as it represents a more accurate judgement of a topic compared to pushing for group consensus (agreement) or convergence, as a stability of responses may present as continual dissensus or disagreement across iterative rounds. Scholars also note the level of agreement reached depends on sample numbers (i.e., high attrition or participant burnout), the aim of the research (i.e., if complete consensus is required), and available project time and resources (C. Hsu & Sandford, 2007).

The literature also shows that participant dropout is inevitable. There are several explanations for Delphi dropout that include, but are not limited to: poor questionnaire design, busy schedules of participants, lack of correspondence between researcher and participants, disinterest by participants, natural time-loss between iterations, and other unknown constraints (Gordon, 1994; C. Hsu & Sandford, 2007).

Several potential challenges need to be considered when implementing the Delphi method. These include the suitability of the methodology, participant selection, timeframe deliverables, survey design, the possibility of low response rates, the possibility of unintentionally guiding participant feedback through leading questions, and data interpretation (Beiderbeck et al., 2021; C. Hsu & Sandford, 2007; Landeta, 2006; Landeta et al., 2011).

3.4.2 The Delphi application

The aim of the Delphi study was to gather the opinions of state and local government planners regarding the barriers and enablers to new park provision across Sydney, and to see if these differed or converged across brownfield and

greenfield developments, or levels of government; the results of which are combined with the semi-structured interviews and provided in Chapter 6. As a result, the thematic findings extracted from participant opinions are designed to contribute to the body of knowledge regarding local park provision, thereby guiding future research and/or policy into the broader field of open space provision and considerations moving forward, both locally and further afield, as a replicable and potentially scalable methodology for future research.

As participants were located across multiple LGAs and from two tiers of government, a Delphi method was viewed as an efficient and suitably rigorous and accepted means of data gathering that would meet the aims of the research. Furthermore, during the 2020-2022 Covid lockdown in NSW, the Delphi method offered a pragmatic strategy to administer the research safely via electronic means without risking the health or discomfort of the participants or the researcher. At the same time, the method might have been seen as an opportunistic way of accelerating data collection in an environment where face-to-face qualitative strategies were too difficult and a variety of other risks were also identified. Table 3 identifies the risks and mitigation measures that were put in place and considered by the researcher regarding the Delphi study component of the research.

Table 3
Delphi study risks and mitigations

Risks	Mitigations
There is a lack of clear methodological guidelines throughout the literature and inconsistency regarding what constitutes a Delphi study or how it should be applied or interpreted. Therefore, reliability and validity are open to question in terms of rigour.	Participant responses were measured for stability of consensus and coded for themes before informing any subsequent rounds of Delphi or the semi-structured interview guide.
The Delphi method, like any qualitative data-gathering exercise, assumes that participants will provide honest responses.	Given the professionalism of all participants and the relevancy of the subject area to the benefit of these organisations, it was assumed that participants gave honest responses, and this was triangulated through thematic and document analysis.
The Delphi method requires a degree of repetition and a time/knowledge investment by participants, thus there is a risk of high participant attrition, boredom or burnout.	A pilot test of the round one Delphi survey was issued to 3 planners from a state government entity and local councils to ensure that the relevance of the subject area, logic of the line of enquiry and the survey design were in line with current best practice, participant comfort and accuracy of estimated timing to complete the questionnaire.
Poor survey design may lead to low-quality results. For example, if a survey design does not phrase questions properly, involves too many questions, takes too long for participants to complete, there are too many Delphi rounds or not enough rounds, the language used within the survey or findings leads to ambiguity, the platform administering the survey is difficult to use, there is a lack of suitable transparency regarding the logistics of the survey or poor instructions are provided.	A mix of question types was incorporated into the Delphi surveys that allowed participants to elaborate on their short-answer options. This encouraged clarification and added value to the data, as it gave participants an option to expand on their views and it gave the researcher an opportunity to follow up for clarification on responses when required. It also gave participants an opportunity to seek clarity if they thought a question was ambiguously worded.
The same survey given to different panels can yield different outcomes. Therefore, questions of reliability and trustworthiness of the research can occur.	This research invited a mix of internal (local council) and external (state government) participants in the sense that participants were not all from the same tier of government. This eliminated internal participant bias and provided a more balanced approach to the panel.
Researcher bias or lack of experience regarding the interpretation of sampling or results could yield low-quality results.	As the researcher was inexperienced, guidance from her supervisory team, who were experienced, was sought if the researcher was in doubt regarding any

Risks	Mitigations
	aspect of the Delphi component of the research, thereby ensuring the data was of relevance, value and validity.
The Delphi method may not be as effective as a group discussion whereby concepts may be broken down and re-assembled in real time using dynamic communication methods.	The researcher stayed connected with all participants throughout the Delphi study process. Any participant who could not participate in the Delphi component of the research was offered an option for a follow-up semi-structured interview instead. This was external to the Delphi component of the research and took place after Delphi completion. The timelines were different and time commitments less, which suited some participants better. The inclusion of a semi-structured interview option also corrected any geographical self-selection bias that inadvertently occurred through the data collection period.

Source: Author. Column A is adapted from Belton et al. (2019); Hasson and Keeney (2011); C. Hsu and Sandford (2007); and Rowe and Wright (2011).

Table description: Table 3 lists Delphi study risks and mitigations. Data is adapted from Belton et al. (2019), Hasson and Keeney (2011), C. Hsu and Sandford (2007) and Rowe and Wright (2011). The table has 2 columns and 8 rows, including the header row. The first column heading = Risk and the second column heading = Mitigations. For each risk in the first column, at least one mitigation is provided in the second column.

3.4.3 Delphi study participation considerations

Where two participants from the same government entity opted to participate in the Delphi study, given the relatively small pool of qualified eligible participants across Sydney, they were encouraged. This benefited the research in two ways: 1) it increased participant uptake for the Delphi study, and 2) it created a mitigation measure against participant drop-outs between Delphi rounds. There were limited participant drop-out numbers between Delphi rounds. If a participant began the Delphi study but was unable to complete the survey, their responses were not included as part of the findings.

The limited participant drop-outs between Delphi rounds were from different government entities, all with multiple-participant representation. This left all

government entities participating in the Delphi study with at least one participant in round two. This in turn validated the inclusion of multiple-participant representation from government entities. Encouraging multiple-participant representation from government entities ensured good relations were maintained with government entities throughout the research lifecycle. Multiple-participant representation also provided insight into the individuality of participants and tested whether participants were inadvertently or otherwise following an organisational line. Frequently, participant responses from the same government entity differed, which indicated that participants were thinking for themselves and basing their responses on their own knowledge, skills and experience. It also illustrated that participants were not taking a strict party line, which in turn showed that they took the research seriously and wanted to have their say. The inclusion of multiple participants from government entities strengthened the methodology and rigour of the research as a result.

One limitation of the Delphi component of the research was participants self-selected to include mostly representatives of inner-ring and middle-ring (brownfield) LGAs. This was mitigated through the use of separate semi-structured interviews as discussed below.

3.4.4 Delphi survey logistics

The Delphi study was broken into a pilot test and two rounds of survey questions. The inclusion of the pilot test response within the round one data analysis was made possible owing to the feedback from the pilot testing from all pilot test participants regarding overall survey feedback, requesting only minor revisions, mainly related to the order of questions rather than thematic content or wording. No significant changes were made from the pilot test to the Delphi round one survey beyond a reordering of questions, a change in font, and the addition of further clarification regarding what was expected of participants regarding upcoming content within the instructions section of the survey. As part of the second-round survey invitations, a thematic summary of the previous round's findings was provided as this is a crucial element to explain the follow-up questions in the second round.

The Delphi pilot and round one survey questions were categorised into three initial themes: 1) influences on park provision; 2) the role of developer contributions; 3) and owing to the timing of the Delphi survey, the effects of COVID-19 on new park

provision. The Delphi round two survey questions explored three new themes and continued scrutiny of the initial three themes based on the analysis of the first-round responses to those themes. The three new themes explored in the round two Delphi survey had some overlap with those explored in the pilot and round one. This was particularly in relation to developer contributions, as these proved to be a contentious topic and required further in-depth exploration. The three new themes for the round two Delphi survey were identified as: 1) ‘smart park’ and design (park innovation); 2) the adequacy of developer contributions and funding mechanisms; 3) inter-departmental collaboration and uses of open space. The semi-structured interviews followed on separately from the thematic findings of the Delphi study and loosely followed its six sequential themes.

As noted above, consensus for a Delphi study can vary. Table 4 provides a list of response definitions and terminology as applied to the findings of this research.

Table 4
Delphi study response categorisation

Term	Definition
Consensus	If 70% or more of the participants agreed/disagreed with a particular statement or short-answer question.
Majority response	If more than half, but less than 70% of participants agreed/disagreed with a particular statement or short-answer question.
Mixed response	If roughly half of the participants agreed/disagreed with a particular statement or short-answer question. Also termed a split response.
Minority response	If less than half of the participants agreed/disagreed with a particular statement or short-answer question.

Source: Author. Adapted from Giannarou and Zervas (2014); Heiko (2012); Holey et al. (2007); and C. Hsu and Sandford (2007).

Table description: Table 4 lists the Delphi study response categorisations used in this study. Data is adapted from Giannarou and Zervas (2014), Heiko (2012), Holey et al. (2007) and C. Hsu and Sandford (2007). The table has 2 columns and 5 rows, including the header row. The first column heading = Term and the second column heading = Definition. For each Term in the first column, a short definition is provided in the second column.

Every effort was made to ensure the relevance of questions to all participants throughout the primary data collection of the research, but inevitably some questions were more relevant to local councils than to state government entities. A copy of the primary data collection tools are provided in Appendix B.

3.4.5 Survey instructions

Participants were requested to answer all questions based on their professional experience. In accordance with ethical considerations, questions were not mandatory beyond the binary question of consent. Participants were freely able to skip questions they were not comfortable responding to or that they deemed not applicable to their current jurisdictional responsibility.

All questions, except one, which asked participants to nominate their years of experience as a planner, asked participants for their opinions based on their experiences in their current NSW government entity position and jurisdiction.

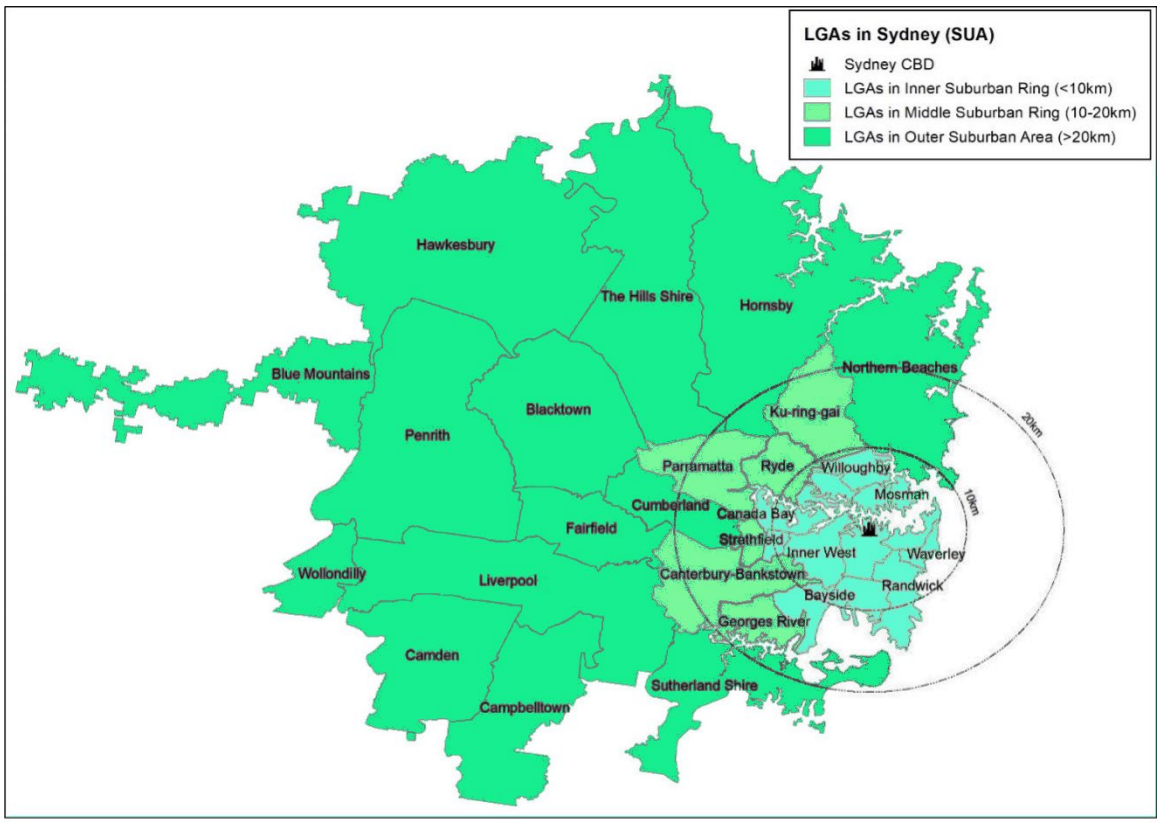
If participants preferred to base their responses on a previous position (or experience in several positions), they were asked to note this in their response. Otherwise, it was assumed participants based their responses on their current jurisdictional responsibilities.

For each question, participants were asked to choose the option most applicable to their jurisdiction or professional situation. For example, some jurisdictions had only brownfield or greenfield areas, while others included a combination of greenfield and brownfield areas. Some questions asked for broader metropolitan consideration, but these were clearly labelled throughout the Delphi surveys of the research.

Definitions of greenfield and brownfield areas were not included as it was assumed that participants would be familiar with the differences. This oversight by the researcher caused a small degree of confusion for several participants when considering their answers in the Delphi study. Therefore, the researcher reallocated several participant responses to the appropriate category when required. This had no bearing on the findings as the amendment of the location category was insignificant.

At the beginning of each Delphi survey, participants were provided with a brief set of logistical questions to ascertain jurisdictional representation, responsibility and professional experience. There were minor discrepancies between participant interpretations of metropolitan location. Therefore, the researcher reallocated jurisdictional representation to better correspond with the figure provided where required (replicated as Figure 3 below). These adjustments were minor and were taken into consideration where needed for participant responses, but they did not affect the overall themes that emerged from this research.

Figure 3
Map of Sydney (SUA) showing LGAs in the Inner Suburban Ring, Middle Suburban Ring and Outer Suburban Area



Source: Author.

Figure description: Figure 3 is a map of the jurisdictional boundaries of Sydney (SUA). The map is overlaid using 2 administrative boundary types. The first boundary type is Suburban Area boundaries, which are shown as 2 concentric rings around the Sydney CBD, and the second type is LGA boundaries. The larger Suburban Area boundary, between the outer and Middle Suburban Ring, is labelled 20km and the smaller Suburban Area boundary, between the middle and Inner Suburban Ring, is labelled 10km indicating the distance from the centre of the Sydney CBD. Larger LGAs are also labelled. The 2 boundary types are coloured black. Each LGA is coloured one of 3 shades of green. A key, titled Local Government Areas in Sydney (SUA), shows that LGAs in the Outer Suburban Area (>20km) = medium green, LGAs in the Middle Suburban Area (10–20km) = light green and LGA in the Inner Suburban Area (<10km) = mint green. The Sydney CDB = a black city icon. The map indicates that the Outer Suburban Area includes all the Sydney (SUA) LGAs north of Ku-Ring-Gai, west of Parramatta and south of the Georges River. LGAs in the Inner Suburban Ring

> extend from Willoughby in the north to Bayside in the South and from Canada Bay in the west to Waverly in the east. According to the map, all other LGAs in Sydney SUA fall in the Middle Suburban Ring.

3.5 Semi-structured interview background and rationale

Semi-structured interviews are regarded by many scholars as the most popular method of qualitative enquiry (W. Adams, 2015; Brinkmann, 2014; Harrell & Bradley, 2009). They are a data-gathering strategy that, like other data collection methodologies, uses a mix of closed and open-ended questions, yet is strengthened by its real-time adaptability and situational awareness (W. Adams, 2015; Kakilla, 2021; Kallio et al., 2016).

Semi-structured interviews are a popular and flexible approach to gathering in-depth insight and data that are easily adaptable to disciplines and research paradigms without compromising the integrity of the method. The conversational nature of the method allows a natural generation of new and flexible ideas compared to alternative methods, such as closed-ended surveys. There is an opportunity for rapport to be quickly built between researcher and participant, which encourages a richness of data, where multiple themes can be discussed simultaneously, and questions, ideas, responses and points of contention can be clarified in real time (Cachia & Millward, 2011; Kakilla, 2021; Kallio et al., 2016).

Semi-structured interviews are considered time-intensive and labour-intensive, both for the researcher and participant, and this can be a risk to a respondent's willingness to participate. Other risks include the subjective nature of semi-structured interviews, which, although highly valuable in gathering qualitative data, can lead to unreliable or irrelevant data if the questions or responses stray too far from the original focus of the research. Risks also include potential language barriers – not only verbal but, if phone interviews are used, the lack of visual contact can create a barrier to interpreting participant responses as body language cannot be noted. Poor notetaking or recording of responses can also lead to unreliable data outputs, particularly if a researcher is inexperienced or unfamiliar with the topic area being discussed.

3.5.1 Semi-structured interviews application

As explained above, the large majority of LGAs that participated in the Delphi study were located in developed (brownfield) sites. Greenfield LGAs that were contacted were initially either reluctant to participate in the research or did not respond to the invitation to take part. To achieve a balance of LGA representation in the research, these LGAs were then invited to participate in a semi-structured interview that discussed the Delphi findings, which enabled them to give their feedback. The interviews specifically targeted local councils from the Outer Suburban Area, with a priority given to the Western Parkland City. This was essential because brownfield areas and greenfield areas have different constraints relating to park provision; the most notable being a difference in land supply.

The semi-structured interviews took place over the phone with three participants individually after the second Delphi round had been completed and the data from the Delphi study collated into thematic findings. The interviews took between 45 and 60 minutes and were designed to triangulate the findings of the Delphi study as well as extend the qualitative research mode of enquiry. In keeping with the Delphi method fundamentals, the interview participant identities were kept private and participants were not known to one another or to the Delphi participants and vice-versa. This was to ensure participant equity and privacy across the lifecycle of the research and as a mark of respect to all participants. Table 5 identifies the risks and mitigation measures that were either put in place or considered by the researcher regarding the semi-structured interview component of the research.

Table 5
Semi-structured interviews risks and mitigations

Risks	Mitigations
Interviews were not recorded; therefore, transcripts could not be obtained, and researcher field notes and memory had to be relied upon.	Extensive notes were taken throughout the interview process and if clarification was required after the fact, the researcher conferred with individual participants as a follow-up measure.
Interviews were not held in person; therefore, non-verbal communication cues may have been missed by the researcher.	Phone interviews were the most convenient option for researcher and participants and were a medium all parties were comfortable and experienced with; therefore, it was assumed nothing was lost by using the phone.
Interviewing is susceptible to language barriers.	The researcher and all participants spoke English as their first language; therefore, language barriers were not a consideration in this instance.
Participants may not answer questions honestly or completely, owing to comfort levels with the topic area, perceived consequences of organisation data breaches or lack of trust of the researcher.	At no point were participants asked to provide information sensitive or personal in nature and participant responses were compared against the Delphi findings and triangulated against document analysis, before feeding into the broader thematic analysis of the findings.
Rapport can be hard to build quickly if researcher and participant are not known to one another or the subject area is sensitive in nature.	Rapport between researcher and participant was easily established through preceding correspondence, the perceived relevance of the topic, professionalism of all involved and through the interview process. Interviews were anonymous to protect participant and organisation privacy.
No innate value may come from the data.	As participants were all planners familiar with and responsible for park provision across their jurisdictions and the interviews themselves were designed to build on previous themes identified in the Delphi study (thereby ensuring subject specificity), participants could speak to the topic and the data provided was of value to the research.
Research bias or inexperience.	The researcher was somewhat experienced with the method, however, guidance from her

Risks	Mitigations
	supervisory team, who were more experienced, was sought if the researcher was in doubt regarding any aspect of the semi-structured interview component of the research, thereby ensuring the data was relevant, valuable and valid.

Source: Author. Column A adapted from W. Adams (2015); Cachia and Millward (2011); Harrell and Bradley (2009); Kakilla (2021); and Kallio et al. (2016).

Table description: Table 5 lists semi-structured interviews risks and mitigations. Data is adapted from W. Adams (2015), Cachia and Millward (2011), Harrell and Bradley (2009), Kakilla (2021) and Kallio et al. (2016). The table has 2 columns and 8 rows, including the header row. The first column heading = Risk and the second column heading = Mitigations. For each risk in the first column, at least one mitigation is provided in the second column.

3.6 Research recruitment and participation

This section provides an overview of how organisations and participants were recruited as potential respondents for the research. It includes strengths and limitations to organisation and participant recruitment specific to this case study. Further consideration to research ethics and data management is also provided in accordance with good practice.

A total of 38 NSW government organisations was approached to support the research over 10 months, between December 2021 and September 2022. These included eight state government entities and 30 local councils. Of the eight state government entities, five agreed to participate. Of the 30 local councils, 16 agreed to participate. A total of 30 research information packs and invitations was sent to individual planners nominated by the final number of 21 government entities taking part in the research. As explained below, not all government entities who agreed to participate ended up taking part in the research.

A total of 17 participants completed the Delphi study and semi-structured interviews. Fourteen (14) of them fully participated in the Delphi study, two (2) in the Delphi pilot study and one (1) who provided external feedback but did not participate

and had no results recorded. Twelve (12) participants took part in the Delphi round 1 survey, ten (10) participants took part in the Delphi round 2 survey and three (3) participants who did not take part in the Delphi study at all participated in semi-structured interviews. Table 6 and Table 7 provide a breakdown of the recruitment and research stages respectively.

Table 6
Participant recruitment

Stage	State government	Local council	Total
Invitations sent	8	30	38
Organisation response/agreed	5	16	21
Organisation participation/actual	4	8	12

Source: Author.

Table description: Table 6 shows participant recruitment stages and intent and participation results. The table has 4 columns and 4 rows, including the header row. The first column heading = Stage, the second column heading = State government, the third column heading = Local council and the fourth column heading = Total. Below the “Stage” column, each subsequent row is provided a header. The second row heading = Invitations sent. The row indicates that 8 state government and 30 local council invites were sent, totalling 38 invites. The third row heading = Organisation response/agreed. The row indicates that 5 state government and 16 local councils agreed to participate, totalling 21 organisations agreeing. The fourth row heading = Organisation participation/actual. The row indicates that 4 state government and 8 local councils actually participated, totalling 12 organisations participating.

Table 7
Individual participation

Stage	State government	Local council	Total
Research participant invitations	9	22	31
Research individual response/agreed	6	18	24
Research individual participation	4	13	17
Delphi pilot	1	2	3
Delphi round one	3	9	12
Delphi round two	2	8	10
Semi-structured interview	0	3	3

Source: Author.

Table description: Table 7 shows the stages of individual participation throughout the Delphi and semi-structured interviews. The table has 4 columns and 8 rows including the header row. The first column heading = Stage, the second column heading = State government, the third column heading = Local council and the fourth column heading = Total. Below the “Stage” column, each subsequent row is provided a header. The second row heading = Research participant invitations. The row indicates that 9 state government and 22 local council invitations were sent to individuals, totalling 31 invitations. The third row heading = Research individual response/agreed. The row indicates that 6 state government and 18 local council individuals agreed, totalling 24 agreements to participate. The fourth row heading = Research individual participation. The row indicates 4 state government and 13 local council individuals participated, totalling 17 full participants. The fifth row heading = Delphi pilot. The row indicates that 1 state government and 2 local council individuals participated, totalling 3 participants. The sixth row heading = Delphi round one. The row indicates that 3 state government and 9 local council individuals participated, totalling 12 participants. The seventh row heading = Delphi round two. The row indicates that 2 state government and 8 local council individuals participated, totalling 10 participants. The eighth row heading = Semi-structured interview. The row indicates that 0 state government and 3 local council individuals participated, totalling 3 participants.

3.6.1 Data ethics and protocols

The data collection phase of the research was separated into two phases based on separate ethics applications as follows: the Delphi survey phase (ETH21-6437) and the semi-structured interview phase (ETH22-7066).

Research protocols were followed by the researcher throughout the lifecycle of the research and documented through the University of Technology Sydney (UTS) ethics process and the UTS Research Data Management Plan (RDMP).

Measures were taken to protect participant privacy and anonymity, given the relatively small size of the planning profession across Metropolitan Sydney. When discussing the thematic findings of the data, extra precautions were taken beyond what was stated in the research protocols or in the information provided to participants, so as not to reveal participant details inadvertently. Therefore, participants were not provided a pseudonym or allocated a number applied to their quotes but were simply placed within the context of the writing as a participant. This is because the researcher was concerned that, after aggregating the findings and assigning numerical values to each participant, there was the potential for participants to recognise one another, based on existing working relationships or other surrounding details contextualising the work. This risk only became apparent throughout the recruitment and research process after ethical approval for the research had been granted.

3.6.2 Recruitment context and limitations

Several approaches were used to recruit suitably qualified participants for the research. Experts were recruited using a series of methods, including leveraging existing professional networks, conditional snowballing and purposive sampling techniques. The purposive sampling used to recruit participants for this research was based on approaching government entities with jurisdictional responsibility or a vested interest in local park provision across the Sydney metropolitan area. As expected, some of the government entities approached for the research did not respond, others responded but did not nominate staff to participate, others responded and nominated staff to participate, but staff did not participate fully or did not participate at all.

A challenge to participation cited by state government entities and local councils in particular was staff shortages and lack of capacity by remaining staff due to other time-sensitive project priorities – notably the extra workload generated in preparation for the NSW planning reforms due to take effect in July 2022. The third wave of COVID-19 and a series of natural disasters that affected NSW and the Sydney region in 2022 further impacted government entity capacity to participate in the research. Ongoing budgetary cuts and complex relations with other related government entities were also cited, particularly from a local council viewpoint as concerns related to their participation. One commonly held view by government entities, particularly from local councils was that they were interested in the findings as they found it useful to know what planners on a collective level saw as the barriers and enablers to park provision across neighbouring jurisdictions.

3.7 Data analysis

This section provides an overview of the data analysis tools used to examine the primary and secondary data. Firstly, it describes the benefits and limitations of thematic analysis. This is followed by a discussion of how thematic analysis was applied across the research lifecycle. Secondly, a brief description of the strengths and limitations of document analysis are provided. This is followed by a short explanation of how document analysis was applied to this research, and in turn how it contributed to the broader findings.

3.7.1 Thematic analysis

Thematic analysis is a cornerstone of qualitative data analysis (Herzog et al., 2019). It is a method – or rather a group of methods – for finding, interpreting and analysing patterns of meaning (themes) from a data set or sets (Braun & Clarke, 2006, 2021; Herzog et al., 2019). Data can include policy documents, interviews, blogs, social media, media articles and other materials.

Thematic analysis is a flexible and adaptable approach unlinked to any specific research paradigm or design. It is not limited by data set size, composition or acquisition. Therefore, it is perfect for smaller case studies. It is an accessible form of analysis as it requires no in-depth knowledge of other methodologies or approaches to be effectively carried out, yet it is a systematic procedure for gathering and

interpreting meaning from data that can provide insight that may not be evident through alternative methods, such as quantitative analysis alone. Thematic analysis is a popular technique used across disciplines and is the foundation of many other forms of qualitative analysis. It is useful in examining data from diverse perspectives and multiple participants to extract the core similarities and differences on which to base the research findings (Braun & Clarke, 2006, 2021; Herzog et al., 2019).

Thematic analysis enables important and interesting themes and patterns in the raw data to be identified, interpreted and evaluated into meaningful research findings. Thematic analysis helps identify clusters of similarity and contrast within the data and allows anomalies within the data to be identified.

The flexibility of thematic analysis as a method of data interpretation leaves it open to criticism as there are multiple outcomes which can be gleaned depending on the lens through which the data is examined. Researcher experience can feed into how data is interpreted, which can lead to a perceived risk of unreliability of data outputs. A lack of transparency regarding the steps taken to ensure the thematic analysis is done with rigour and systematically can also lead to questions regarding data considerations and conclusions (Maguire & Delahunt, 2017; Nowell et al., 2017).

3.7.2 Thematic analysis application

Thematic analysis was a foundational component of the thesis. Thematic analysis was applied to all three elements of data that make up the findings of this research as noted above. This included secondary and primary data analysis from: 1) State policy documents; 2) funding and resource allocation for open space provision; 3) current and future analysis of urban density and land use for open space provision; 4) the combined findings from the Delphi and semi-structured interviews. Table 8 provides a list of risks and mitigations as they apply to this research.

Table 8
Thematic analysis risks and mitigations

Risks	Mitigations
There is limited literature on how to conduct a rigorous thematic analysis, therefore it is all too easy to misidentify or misunderstand to what extent, how, where or why thematic analysis should be used.	The thematic analysis followed a systematic six-step trustworthy process outlined in previous research, and the data was triangulated against document analysis.
The inexperience of the researcher in identifying and interpreting codes and themes could have led to misleading or inaccurate findings. Too much flexibility with the approach could have diluted it compared to other approaches.	As the researcher was inexperienced, she sought guidance from her more experienced supervisory team if she was in doubt regarding any aspect of the thematic analysis component of the research, thereby ensuring that data interpretation was relevant, valid and of value.
Lack of transparency or accountability when using the method can lead to ambiguity and questions about the trustworthiness of the findings. There is no agreement regarding how or when the method should be used, let alone how to account for it within the findings or methodological choices and frameworks.	An explanation of the ontological position taken by this research is provided, along with the research paradigm. Therefore, there is a sound methodological underpinning and transparent provision for using thematic analysis as a data analysis tool. Thematic analysis was used across both primary and secondary data analysis components of the research. Thematic analysis was used as a bridge between research components including linking the broader academic literature with the findings.

Source: Author. Column A adapted from Braun and Clarke (2006, 2021); D. Byrne (2022); Clarke and Braun (2021); Finlay (2021); Maguire and Delahunt (2017); and Nowell et al. (2017).

Table description: Table 8 lists thematic analysis risks and mitigations. Data is adapted from Braun and Clarke (2006, 2021), D. Byrne (2022), Clarke and Braun (2021), Finlay (2021), Maguire and Delahunt (2017) and Nowell et al. (2017). The table has 2 columns and 4 rows, including the header row. The first column heading = Risk and the second column heading = Mitigations. For each risk in the first column, at least one mitigation is provided in the second column.

3.7.3 Document analysis

Document analysis is a research method that enables data to be interpreted to elicit meaning, gain understanding and develop empirical knowledge (Armstrong, 2021; G. Bowen, 2009; Morgan, 2022; Rapley & Rees, 2018). Documents supply

data and context within which researchers, participants and beneficiaries work. They are useful for triangulation, contrasting and comparing research findings or corroborating research evidence, and can be a time/resource/economically effective means of data gathering.

Documents provide an unobtrusive form of data gathering, as they are non-reactive to the research process. Their static nature means that they supply insight into events that can no longer be observed such as superseded policy documents or legislative frameworks, or equally as relevant to this research, a snapshot into future focused thinking through current strategic plans. Lastly, they can provide a counterweight to researcher reflexivity and bias when used in conjunction with accompanying research methods (G. Bowen, 2009; Gross, 2018; Karppinen & Moe, 2012).

The limitations to document analysis include concerns regarding the accuracy of the data they provide, which may lead to misinformation. Documents may lack detail, may be too complex for a non-expert to understand or may not be retrievable from a database. Being a one-way form of communication, they may be open to misinterpretation. Finally, owing to their sensitive nature or to their owners being unresponsive to requests for access, documents may simply be unavailable (G. Bowen, 2009; Gross, 2018).

3.7.4 Document analysis application

Document analysis formed part of the secondary data analysis component of the research and was specifically used to collect and analyse NSW policy documents. As noted above, document analysis was further umbrellaed under the thematic analysis component of the research, and thus also contributed to the findings of this research, whilst simultaneously confirming much of the existing literature regarding open space provision. Table 9 identifies the risks and mitigation measures that were put in place and considered by the researcher regarding the document analysis component of this research.

Table 9
Document analysis risks and mitigations

Risks	Mitigations
Documents may not provide an accurate account of events or the information being recorded. For example, documents may align with organisation policies, branding or author bias.	It was assumed that policy documents would be in line with organisational aims, goals and intended image. This was counteracted using the Delphi method to gather data from planners within the organisations involved.
Documents may not provide enough detail, be too complex to understand, be misleading or evidence may be contradictory. This can weaken the trustworthiness of document analysis.	Document analysis was used to triangulate the research findings and examined against comparable documentation for validity.
Documents may not be available for data retrieval, thereby making them inaccessible. There is a risk of researcher bias regarding document selectivity.	Where documents were not easily retrievable, advice and resources from the researcher's faculty-specific librarian, supervisory team, professional networks and other university resources were sought where possible comparable alternatives were provided.

Source: Author. Column A adapted from Armstrong (2021); G. Bowen (2009); Gross (2018); Karppinen and Moe (2012); and Morgan (2022).

Table description: Table 9 lists document analysis risks and mitigations. Data is adapted from Armstrong (2021), G. Bowen (2009), Gross (2018), Karppinen and Moe (2012) and Morgan (2022). The table has 2 columns and 4 rows, including the header row. The first column heading = Risk and the second column heading = Mitigations. For each risk in the first column, at least one mitigation is provided in the second column.

3.8 Inclusive practice document considerations

Increasingly there is an expectation across academia, industry and society that information is presented using inclusive practices. Inclusive data practices are a form of communication that allows for and assumes audiences experience diverse needs, wants and means of accessing data. It goes beyond tailoring a message to a pre-determined audience based on a set of assumptions, to creating something with more flexible mechanisms for audience engagement and understanding. For example, the translation of complex findings through simple visuals (Botsis et al.,

2020), the use of narrative to foster dialogue and understanding (B. Smith et al., 2015) or the use of plain language summaries and documents (Cutts, 2020). This strand of inclusive thinking/implementation originated and is most commonly found in the field of disability studies (Gleeson, 1997; Johnson & Walmsley, 2003). More recently, elements of inclusivity are found across the health and science disciplines as a practical means of translating complex ideas for non-scientific/non-expert audiences (Franconeri et al., 2021; Grainger et al., 2016; Grimshaw et al., 2012). There is also a growing recognition of inclusive practices across education as a means of knowledge dissemination and learner engagement (Stentiford & Koutsouris, 2021). Rarely are such measures implemented across the discipline of social science despite the known benefits of increased access to information. This may be explained by the assumption that social science is 'simple' enough and therefore does not need translation.

Inclusive practices relating to the presentation of this thesis are based on four principles: 1) provide access to knowledge using principles of equity for readers with diverse preferences; 2) to alleviate the extra cognitive burden placed on readers with diverse preferences; 3) for readers with diverse preferences not to require further specialist technology, skills or knowledge; 4) to ensure the information is easily discoverable (Ganner et al., 2023; Lundgard & Satyanarayan, 2021; Menzies et al., 2022; W3C, n.d). The principles are implemented via four interconnected facets of inclusive practice identified by the researcher:

1. By adapting the American Psychological Association guidelines (APA) (APA, 2022).
2. By incorporating recommendations from the Web Content Accessibility Guidelines (WCAG) and a publication on creating more accessible documents from the Institute of Professional Editors (IPEd) and the Australian Publishers Association (Ganner et al., 2023).
3. By including replication greyscale maps and figures provided in Appendix A.
4. By creating long-form narrative descriptions for all maps, figures, flowcharts, tables and graphs.

The inclusion and adjustment of numerous data presentation properties within the layout of this thesis are provided to increase the overall electronic and visual accessibility, readability and capacity for reader engagement with the document.

3.8.1 American Psychological Association seventh edition accessibility adjustments

The American Psychological Association (APA) has a set of style guidelines to address the needs of users worldwide who access works in the American Psychological Association preferred formatting conventions in multiple contexts and modalities, including traditional print and electronic resources (APA, 2022). While this thesis uses the seventh edition of the American Psychological Association (APA7) as the basis of its formatting, the section in the APA7 style manual covering accessibility requirements for diverse users has a new addition that recognises that not all users can access information using the same means and it encourages users to refine the conventional recommended academic format as needed to meet the needs of their 'specific communities' (APA, 2022).

Techniques used in this thesis build directly on the APA7 style guidelines using a three-fold approach based on a combination of evidence and researcher experience:

1. Practices from the Web Content Accessibility Guidelines (WCAG), which is published in continual iterations by the World Wide Web Consortium (W3C), have been adapted to suit this document. The World Wide Web Consortium is a global not-for-profit standards organisation specifically devoted to standards, guidelines and expected behaviours on the internet. While the Web Content Accessibility Guidelines (WCAG) were designed primarily for online publications, of most relevance to this research are the guidelines on the presentation of downloadable electronic materials (W3C, n.d.). As this document will be accessed predominantly as an electronic resource on the internet, it is therefore fitting that the Web Content Accessibility Guidelines are applied where possible as a means of ensuring this thesis is electronically accessible.
2. Practices from *Books without Barriers: A Practical Guide to Inclusive Publishing* (Ganner et al., 2023), a recent guide published by the Institute of

Professional Editors and the Australian Publishers Association, have been adapted to suit this document. The guide provides practical advice regarding how to create more accessible books. Many of the techniques, like those in the American Psychological Association seventh edition guide, have been adopted from the Web Content Accessibility Guidelines (thus proving their transferability to a range of situations).

3. The knowledge and skills gained from the researcher's decades of previous professional experience regarding document remediation; accessible print advocacy and successful project outcomes have been used to ensure a balanced approach to the adaptation of the American Psychological Association guidelines. A mix of academic convention and accessible practices have been used within this thesis.

According to the American Psychological Association, creating inclusive documents requires a two-fold approach:

1. The document should service the needs of what the American Psychological Association term "atypical users", if required, without losing the intended nuance and character of the document (to not impede too greatly on "typical users").
2. The American Psychological Association concedes a document should be created that allows users with additional requirements to use technology to adapt the document to their own preferences (American Psychological Association, 2022).

The acknowledgement by the American Psychological Association that users may have diverse requirements when accessing information is a step in remediating exclusionary data practices in academia. As noted previously, uptake of inclusive data dissemination techniques within academia are limited outside of certain disciplines such as disability studies (Gleeson, 1997; Johnson & Walmsley, 2003), science (Grimshaw et al., 2012) and education (Stentiford & Koutsouris, 2021), despite the well-documented benefits they provide.

As indicated above, adjustments to the recommended American Psychological Association format include measures borrowed from the *Web Accessibility Content Guidelines* (WCAG) aimed at improving the reading experience for people with

dyslexia, such as providing all headings in sentence case and using a consistent typography throughout the thesis[13]. The additional measures adapted from *Books without Barriers: A Practical Guide to Inclusive Publishing* (Ganner et al., 2023), include, for example, modifications to the visual presentation of tables to include table borders, column dividers and shading on alternate rows. These changes service a variety of developmental reading deficiencies (DRDs) also commonly referred to as dyslexia or low literacy, and other conditions that make reading difficult, while also benefiting users of adaptive technologies such as screen magnifiers, text-to-speech screen readers and other software or firmware elements.

A further measure of readability has been taken throughout this research whereby acronyms of government departments and titles of policy documents are frequently written in full within the body text of the thesis[14]. The aim of making these adaptations to the traditional American Psychological Association formatting style and layout that extend beyond the strictures of traditional academic context, is to create a more equitable reader experience. This measure may not suit all readers who expect to encounter acronyms of government departments and truncated titles of policy documents, but the increased readability measures used in this document do not take away from the capacity of understanding of this work, whereas to exclude such measures may inadvertently diminish the clarity of the document.

3.8.2 Greyscale maps and figures

Greyscale maps and figures are provided as an addendum to the document for people who experience colour vision deficiency (CVD), also commonly referred to as colour blindness, as an addition to the long-form narrative descriptions provided below each colour map in the document[15]. Colour is proven to be a good way to engage people with research and to break down complex information or present large amounts of data into something more palatable for the reader. The use of colour can be misunderstood by some people owing to how they interpret and comprehend certain colours or colour combinations. Using greyscale is an alternative to using colour to convey ideas advantageous for information dissemination (Angerbauer et al., 2022; Carnemolla et al., 2023; Culp, 2012; Rheingans, 2000). Providing greyscale maps and figures as part of the document allows readers to access the data based on preference, without having to rely on the narrative descriptions as the only alternative means of access to the data.

3.8.3 Long-form narrative descriptions

Long form narrative descriptions are a form of accessible data visualisation that provide an equivalent text-based description of a visual data output for readers who are unable or prefer not to engage with traditional forms of data visualisation such as people who are blind or have low vision and rely on adaptive technology to access information. For the purpose of this research, a data visualisation is any graphical representation of data not included as a linear narrative within the body text of the thesis. These include: 1) figures such as flowcharts; 2) tables; 3) maps; 4) bar graphs. Long form narrative descriptions provide a similar service to a visual data output by tying information into the broader body text just as a data visualisation is designed to do. Traditionally, long-form narrative descriptions of visual data outputs have been hidden behind web elements as not to be discoverable by readers who do not use adaptive technology (W3C, n.d.). Using long-form narrative descriptions as a supporting tool for data visualisation has been linked with increased reader engagement and understanding of the visual output (Hullman & Diakopoulos, 2011; Segel & Heer, 2010).

Long-form narrative descriptions are provided in the main body of this thesis in line with the principles of inclusivity outlined above. There is no need for a reader to engage with this aspect of the thesis if they should choose to skip over their content.

3.8.4 Long-form narrative description approach and layout

Long-form narrative descriptions are located immediately below each data visualisation. Where possible, long-form narrative descriptions are kept on the same page as the data visualisation to provide continuity to the document and reader experience. The placement of the long-form narrative descriptions have also been weighed up against the necessity for the visual output to be easily understood by readers who choose not to engage with them. Therefore, in some instances, in order not to crowd the visual data output, or where there is a lack of space for the corresponding long-form narrative description, it has been placed on the following page immediately adjoining the visual output. Long-form narrative descriptions use deliberately repetitive language to indicate direct linkages between the data visualisation, the narrative description and the surrounding body text. For example, table numbering, figure labels, source attribution and other details are repeated within the long-form narrative description as a means of reassuring the reader of the

inter-dependence between the visual and non-visual data components of the document. This linear provision of details is designed to provide an equivalent experience of engagement with a visual output that is gained from normative visual processing. This is especially important for people who are blind or have low vision and rely on adaptive technology to access information (Ganner et al., 2023; Kreiss et al., 2022; W3C, n.d.).

A consistent typography has been used throughout each narrative description. This is to say, narrative descriptions that do not include secondary dataset or document titles. Where secondary dataset or document titles are provided, they are italicised as to align with academic convention as practiced throughout the thesis[16]. Inclusion of secondary data set or document titles within the narrative description serve the purpose of reducing cognition for the reader[17]. Sentence case is used for each heading as to ensure consistency of visual integration throughout the thesis. Acronyms are used within the narrative descriptions as a means of minimising the length of text where the full phrase of the abbreviation has been provided in the nearby corresponding body text of the thesis. Visually, long-form narrative descriptions are identifiable from the body text by a thick green line down the left-hand margin and by being left-indented.

There is consensus across the literature regarding the need for a systematic approach to long-form narrative descriptions of data visualisation, particularly in relation to increasing data accessibility (Ganner et al., 2023; Hullman & Diakopoulos, 2011; Kreiss et al., 2022; Lundgard & Satyanarayan, 2021; W3C, n.d.). As to what details could or should be included within narrative descriptions is highly debated among practitioners and end users alike. What is clear is the need for narrative descriptions to be context specific, correspond with the relevant visualisation and fit into the surrounding body text. Beyond the semantics, there is a strong argument to be made, that it is better to include a narrative description than it is to exclude it on the basis of uncertainty from consideration all together.

For the purposes of this research, the hierarchy of the long-form narrative description in relation to each data visualisation is based on the work of Lundgard and Satyanarayan (2021), who provide a formula for describing data visualisations based on natural language processing approaches. Each long-form narrative description is adapted to fit the purpose of the visual output. Each element sits

beneath its predecessor: 1) elemental and encoded properties; 2) statistical concepts and relations; 3) perceptual and cognitive phenomena; 4) contextual and domain-specific insights.

1. On the highest level of data presentation hierarchy, the elemental and encoded properties of the visual data are framed for equivalent visual context. This includes information such as the format of the visual data – whether it is a bar graph, map, or table, along with the visual data output, title and legend, the encoding channels, axis labels and axis scales.
2. Directly below the elemental and encoded properties level of information, statistical concepts and relations are provided. This level explains the objective data represented in the data visualisation. These are provided as semantic sentences that refer to abstract statistical concepts and relations that are latent within the dataset, such as the mean or standard deviation of a variable, and to correlations or relationships between points of data.
3. Directly below the statistical concepts and relations data are the descriptions of the perceptual and cognitive phenomena that emerge from the data visualisation. These are the semantic sentences that convey the meaning or overall trends that can be gained from the visual data, such as themes, concepts or other observationally perceptible information.
4. Directly below the perceptual and cognitive phenomena data, the contextual and domain-specific insights into the data are provided. This means that the themes and trends found within the perceptual and cognitive phenomena data are explored in greater depth or applied to other data and existing knowledge. Contextual and domain-specific insights are often based on opinions about the data visualisation rather than the data itself and are applied to the real world (Lundgard & Satyanarayan, 2021).

For the purposes of this research, the contextual and domain-specific insights gained from the visual data are frequently discussed within the body text of the thesis in relation to the visual data output, rather than being included within the long-form narrative description (unless they are deemed useful to the description itself). If contextual and domain-specific insights are considered useful to the direct understanding of the data visualisation, such as themes that emerge through the

visual data output that are otherwise not explained through the previous elements of the long-form narrative description data hierarchy, these are then included as appropriate. Inclusion of the contextual and domain-specific insights can create repetition when examined in the broader context of the body text of the thesis, yet this is important to include within the long-form narrative descriptions for clarity and continuity, particularly when considering readers who may use adaptive technology to engage with the material and are unable to engage directly with the data visualisations.

Depending on the type of visual data output, i.e. a table, map, bar graph or figure, the properties included within each long-form narrative description were adjusted. For example, some data visualisations such as maps were more complex and required a greater number of hierarchical elements to be included within the long-form narrative description. Other data visualisations such as a simple table, required fewer data hierarchical elements to be included. Each long-form narrative description was approached systematically in line with the principles outlined above yet was crafted to suit the individual data visualisation. This ensured meaning, relevancy and accuracy were applied to each data visualisation. If secondary data were used to create the visual output, the long-form narrative descriptions were triangulated against the data visualisation itself and the raw secondary data.

As noted in Section 1.2.4 “Thesis presentation”, this research expands on the work of Carnemolla et al. (2023), Frumkin (2021) and Pham (2020), each of whom provide different forms of but specific narrative descriptions to accompany their maps and graphics. All be it seemingly somewhat inadvertently in the case of Frumkin (2021) and Pham (2020), the latter whose work involved complex maps that benefited from detailed written explanation closely resembling the approach of Lundgard and Satyanarayan (2021) embedded throughout the document. Neither output mentioned inclusive data visualisation as a consideration. Nevertheless, they are each powerful examples of inclusion in practice that illustrate the applicability and flexibility of the methodology without requiring an explicit acknowledgement. When inclusion becomes convention, which when applied to Frumkin (2021) and Pham (2020), visual data description was likely considered as simply good research. Therefore, there was no need to view it as anything else. Knowledge gained through the researcher’s involvement with the work of Carnemolla et al. (2023) was

appropriated as part of the methodological considerations regarding the inclusion and enhancement of data visualisation in this thesis. The combined mediums of data visualisation and long-form narrative description are provided in a deliberate and systematic way to convey information (Lundgard & Satyanarayan, 2021). Through combining both data presentation techniques, each reinforces the message of the other, yet simultaneously allows the reader a preference regarding how they access the data for themselves, without the need for reverse engineering or further document remediation measures. Providing long-form narrative descriptions in an open manner ensures they are easily discoverable and the cognitive burden experienced by readers who use adaptive technology is reduced. Furthermore, by providing long-form narrative descriptions outside of hidden web elements, it increases their impact and potential for engagement by readers with diverse requirements who do not use adaptive reader technology, such as people who experience low graphic literacy or other developmental reading deficiencies (DRDs). On a broader level, the inclusion of long-form narrative descriptions within this thesis highlights the importance of creating inclusive processes for data dissemination that extends to the diversity of reader preference and means of engagement experienced across academia (Brown et al., 2018; Ganner et al., 2023; Lundgard & Satyanarayan, 2021; Menzies et al., 2022; Neves, 2022; B. Smith et al., 2015; W3C, n.d).

Using a systematic approach to long-form narrative descriptions as part of data visualisation outputs encourages deeper interaction with the data, as it allows the researcher to consciously translate the data visualisation into a secondary medium. Therefore, the researcher may gain further insight into the data than they otherwise would have if a systematic approach to creating a long-form narrative description had not been utilised.

Long-form narrative descriptions are considered time-intensive and labour-intensive for the researcher if done manually, and this can be a barrier to researcher uptake. Furthermore, researchers may view long form narrative descriptions as too repetitive, if they consider them at all. Other risks include the somewhat subjective nature of long-form narrative descriptions in relation to data visualisation, which, although highly valuable in deepening researcher and reader engagement with the data, can lead to unreliable or irrelevant data if the long-form narrative descriptions

stray too far from the original focus of the visual data output, or if a systematic approach is not used (Lundgard & Satyanarayan, 2021). Different visual data outputs require different considerations to be applied to the process of creating meaningful long-form narrative descriptions (Grainger et al., 2016; Kreiss et al., 2022; Lundgard & Satyanarayan, 2021). This can be problematic if the researcher is unfamiliar with the fundamentals of creating long-form narrative descriptions. Other risks emerging in relation to creating long-form narrative descriptions is the mainstream advent of artificial technology (AI). AI is a time efficient means of creating long-form narrative descriptions of data visualisation, yet at the time of writing (May 2024), AI descriptions of visual outputs are not always accurate. Therefore, researcher intervention and application of critical thinking is required to ensure meaningful data outputs. Furthermore, concerns and implications regarding privacy and sensitive data inputs and outputs also need to be considered (Jeong et al., 2023; Lundgard & Satyanarayan, 2021). Table 10 identifies the risks and mitigation measures that were put in place and considered by the researcher regarding the Delphi study long-form narrative description of the research.

Table 10
Long-form narrative description risks and mitigations

Risks	Mitigations
Literature is limited regarding how to provide long-form narrative descriptions as part of data visualisation techniques.	The researcher capitalised on previous experience and familiarity with long-form narrative description provision and used a combination of web accessibility principles and a four level semantic data hierarchy to create long-form narrative descriptions.
Long-form narrative descriptions are only as good as the data visualisation they describe.	Data visualisation is a normative practice. If in doubt regarding the use of a particular type or element of data visualisation, the researcher sought feedback from her supervisory team. Data visualisations used within this research are a secondary tool for conveying information and are scaffolded by the body text and long-form narrative descriptions.
Use of long-form narrative descriptions are not frequently used in social science research and may not be considered relevant.	The use of long-form narrative descriptions is used as part of web accessibility principles as a means of data dissemination and are proven to improve audience engagement and understanding.
Researcher unfamiliarity with the process of creating long-form narrative descriptions can lead to low quality or confusing data outputs.	The researcher was experienced with the approach, however, guidance from her supervisory team and other experts was sought if the researcher was in doubt regarding any aspect of the long-form narrative descriptions, thereby ensuring the data was accurate, relevant and meaningful.
Long-form narrative descriptions may not provide an accurate or relevant account of the data visualisation.	A four-step systematic approach based on previous research for providing long-form narrative descriptions was implemented to ensure meaningful data outputs.
AI can be unreliable as a primary translation tool for data visualisation.	AI was not considered or used as a visual data interpretation tool throughout this research.

Source: Author. Column A adapted from Duarte et al. (2019); Franconeri et al. (2021); Ganner et al. (2023); Grainger et al. (2016); Hullman and Diakopoulos (2011); Jeong et al. (2021); Kreiss et al. (2022); Lundgard and Satyanarayan (2021); Segel and Heer (2010); and W3C (n.d.).

Table description: Table 10 lists long-form narrative description risks and mitigations. Data is adapted from Duarte et al. (2019), Franconeri et al. (2021), Ganner et al. (2023), Grainger et al. (2016), Hullman and Diakopoulos (2011), Jeong et al. (2021), Kreiss et al., 2022, Lundgard and Satyanarayan (2021), Segel and Heer (2010) and W3C (n.d.). The table has 2 columns and 7 rows,

including the header row. The first column heading = Risk and the second column heading = Mitigations. For each risk in the first column, at least one mitigation is provided in the second column.

3.8.5 A final note on data presentation application

This section has explained why, where and how different data visualisation methodologies have been applied to this research. Given the unconventional approach to data presentation of this thesis, the researcher felt it necessary to provide further justification of her choices. The techniques used to apply a more inclusive and accessible form of data visualisation and research presentation are based on an interdisciplinary approach which draws from a number of fields including disability studies, science, marketing, education and computing. By combining these learnings, the presentation of this research goes beyond surface level measures of appeal, convenience (or inconvenience) to provide a deeper and for many a more meaningful opportunity for data engagement, thereby creating more nuance within the work. This is a significant contribution to the body of knowledge as it highlights the lack of inclusivity when considering data dissemination experienced across academia, evidenced by the lengthy explanation of its consideration and application in this thesis and the contrasting layout therein in comparison to typical academic outputs. The thesis offers a practical example and systematic formula for future research to consider that is not discipline specific and can be adapted accordingly.

3.9 Summary of methodology

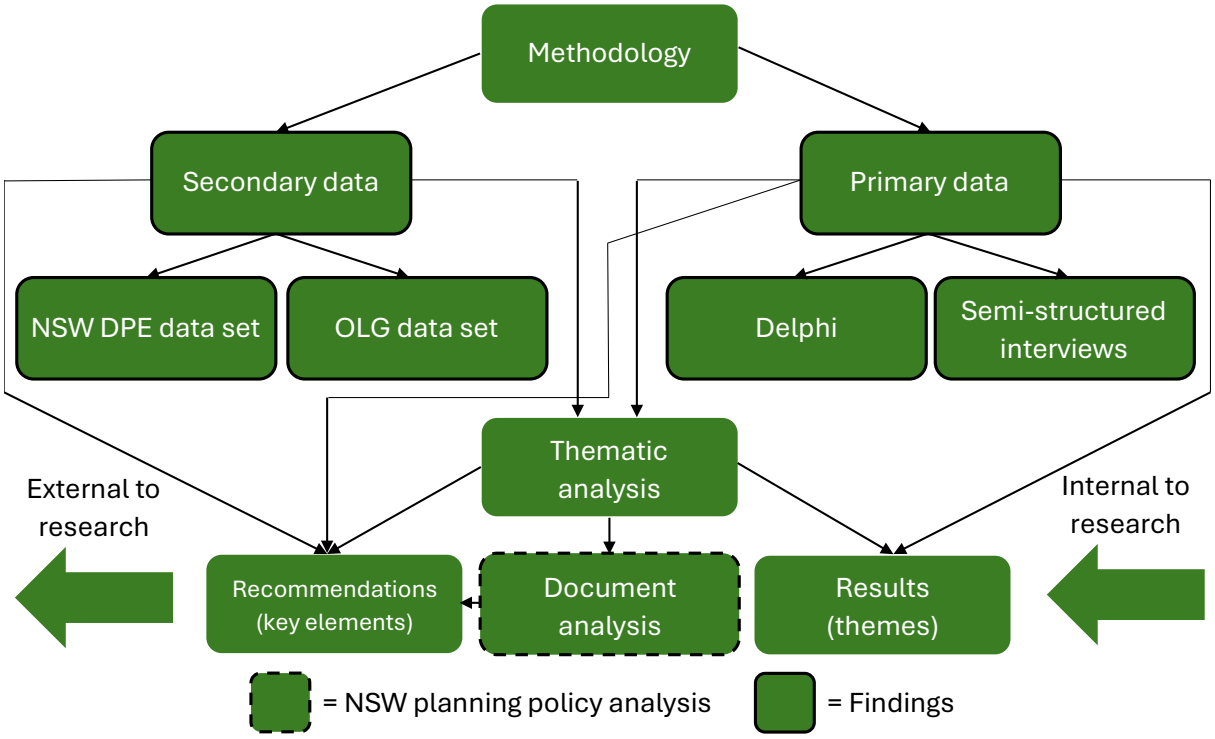
The aim of this research was to gather state and local government planners' perspectives within the decision-making environments they operate in regarding new park provision. Sydney was chosen as the case study for this research. Planners from state government entities and local councils were approached to participate in the research based on their professional connection and responsibility for open space provision. In order to achieve the research objective, a suitable methodology was utilised to ensure rigour and validity of the research that included considerations of the broader case study context and participant well-being. This chapter provides a systematic and transparent account of the methodological approach as a means of ensuring the research findings are held to account and the methodology can be replicated for future research. The chapter was set out in the following way:

The chapter has provided an explanation of the philosophical underpinnings and methodological components that form the foundation of this research. The chapter was broken into multiple sections, each of which dealt with a different methodological consideration and their direct application to the research. The chapter is presented in such a way as far as possible to mirror the chronology of the secondary and primary data collection approaches used in the following three chapters as a roadmap for navigating the findings.

1. An explanation of the critical realism approach underpinning the research, chosen because it is amenable to both the complexities of urban planning practice and case study research.
2. An explanation of the geographical boundaries that make up the case study were provided as they have a significant baring on the findings. This was followed by an explanation of the secondary data sets from the NSW Department of Planning and Environment and Office of Local Government used in Chapters 4 and 5.
3. An explanation of the Delphi and semi-structured interview components of the research were provided, including how they were applied to the research and the processes therein, the results of which are in Chapter 6.
4. An explanation of both the thematic analysis and document analysis tools were provided as they contribute to the research results, discussion and recommendations. This is to say, the methodological components used within this research to both conduct and analyse the secondary and primary data (separately and combined), although presented in a linear fashion, are a set of interlinked elements that inform the findings, discussion and the recommendations provided by this research.
5. Lastly, a description of the inclusive data presentation techniques used throughout this thesis was provided as not only does it contribute to the methodological underpinnings of this research, but it is an important contribution to the body of knowledge this research represents.

Figure 4 provides a visual summary of how the different methodological components of this research fit together.

Figure 4
Summary of methodology



Source: Author.

Figure description: Figure 4 is a flowchart that shows how each methodological component of the research relates to each other. The first box of the flowchart is "Methodology", which has two arrows pointing towards two different boxes – "Secondary data" on the left and "Primary data" on the right. The "Secondary data" box has arrows pointing towards the "NSW DPE data set", "OLG data set", "Thematic analysis" and "Recommendations (key elements)" boxes. The "Primary data" box has arrows pointing towards the "Delphi", "Semi-structured interviews", "Results (themes)", "Thematic analysis" and "Recommendations (key elements)" boxes. The "Thematic analysis" box has arrows pointing towards the "Recommendations (key elements)", "Document analysis" and "Results (themes)" boxes. The "Document analysis" box has an arrow pointing towards the "Recommendations (key elements)" box. The boxes with a black outline ("Primary data", "Secondary data", "Delphi", "Semi-structured interviews", "NSW DPE data set" and "OLG data set") = Findings, and the box with a dashed black outline ("Document analysis") = NSW planning policy analysis. There is an arrow pointing inwards towards the "Results (themes)" box with text above it saying, "Internal to research", and there is an arrow pointing outwards from the

> “Recommendations (key elements)” box with text above it saying, “External to research”.

Chapter 4: Planning, policy and funding for open space provision

4.1 Introduction

This research explores local authority decision-making environments facilitating the provision of a key element of liveable and healthy cities: parks. The research uses Sydney, Australia, as a case study. This is the first of three findings chapters. This chapter is divided into six sections. The first section outlines the strategic and legislative frameworks that guide the NSW planning system. The second section focuses on current metropolitan strategies and chronicles the rise and fall of the Greater Sydney Commission, outlining how the *A Metropolis of Three Cities* document (GSC, 2018b) relates to open space provision. The third section thematically analyses open space policy in NSW. The fourth section discusses the funding of open space provision in Sydney as a case study that includes developer contributions. The fifth section analyses NSW state government grants administered predominantly by the former NSW Department of Planning and Environment, aggregated to a local government area (LGA) level and the potential for shared use arrangements. This is followed by a summary of the chapter.

This chapter focuses on broader strategic and legislative planning data and the first essential form of resource allocation, in the form of funding for open space provision as administered within the NSW planning system. As detailed in Section 3.3.4 “Secondary data”, this chapter uses relevant indicators from the Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) to establish proxy values of funding mechanisms for developer contributions aggregated to a local council level for the year 2019-2020. Secondly, NSW Department of Planning and Environment public facing data relating to various individual funding initiatives from across multiple web pages are examined to establish estimated values for NSW state government grants administered to local councils for open space provision over a period of five years between 2018-2023, such as the *Metropolitan Greenspace*

Program (DPHI NSW, 2024h). Data is aggregated to an LGA level and adjusted to fit the definition of Sydney used in this research.

4.1.1 Planning frameworks in Sydney

Park provision has long been a signifier of place and local identity across Sydney (Acuto, 2012; Goodal et al., 2005; Hoskins, 2003b; Marshall & Corkery, 2011; Veal, 2013). Having evolved to match modern expectations, park provision as a part of broader open space initiatives is heavily embedded into planning strategies such as the *A Metropolis of Three Cities* (GSC, 2018b), the *Five district plans* (GSC, 2018a), reporting mechanisms such as the local council *Integrated Planning and Reporting framework* (OLG NSW, 2021b, 2021c) and funding schemes such as the *NSW Public Spaces Legacy Program* (DPHI NSW, 2024i).

Sydney, like any city, has a legacy created by previous built-form decisions and priorities that contest what can be achieved in terms of open space provision, which are reflected throughout the various planning strategies extending from the 1948 County of Cumberland Planning Scheme through to the present document (GSC, 2018b).

The interplay between legislative frameworks, policy infrastructure and urban governance hierarchy are key factors to consider when looking ahead toward new park provision in Sydney as a rapidly densifying environment. As noted elsewhere, the topography of Sydney is restricted, therefore continued urban sprawl is not possible. Thus, if Sydney is to remain on the trajectory of increased urban growth, densification is the only option, and park provision will have to find a way to keep pace. However, with land availability set to diminish, and city-dweller demand set to intensify, the value of relevant, quality and robust policy to guide the formation of open space outcomes is essential. The chapter further reiterates the primary data findings from this research, by firstly providing a sound basis for the regulatory context in which planners work, and secondly by quantitively illustrating how potential and actual funding for park provision is distributed across local councils.

4.2 Strategic planning

Australia has three tiers of government: federal, state, and local. Urban planning in Australia is largely the responsibility of state and territory governments, with local

councils charged with implementing the broader scope planning priorities in line with local character and residential need (LG NSW, 2023). Planning has traditionally rested with the states and territories, and local councils, with relatively less input from federal government in relation to open space provision beyond periodic guidelines that directly or indirectly offer advice and reiterate the value of open space to cities and regions (Commonwealth of Australia, 2024; DIRDC, 2024; Infrastructure Australia, 2019). In Australia, local governments are established under state legislation and have limited powers. Furthermore, as touched upon in Section 1.3.3 “The strength of Sydney as a case study city”, Sydney experiences a level of complexity in relation to urban governance mechanisms as compared to elsewhere in Australia. This was particularly evident between 2015 and 2023, when Sydney had an extra layer of statutory governance via the Greater Sydney Commission – an independent statutory planning authority (funded by State Government), but which has since been disbanded; the chronology of which is provided below.

The dominant means of planning for Australian capital cities is through metropolitan planning strategies. Australian metropolitan planning strategies are traditionally set up in a top-down fashion and rely on long-term targets in the pursuit of urban/spatial outcomes (Frost & McDonald, 2011; Gleeson et al., 2004; Searle & Bunker, 2010). However, as noted throughout the broader literature and the findings of this research, an ongoing challenge regarding the implementation of policy is how many of their objectives can be translated into practice.

Conceptually a metropolitan plan is defined as a strategic plan for managing change in urban regions. Although Metropolitan strategies are often based on elements of legislation, statutory controls, and policy initiatives, at the core of metropolitan strategies they are a framework distinguishable from spatial scale statutory planning instruments owing to their oversight rather than the enforcement of urban change (Gleeson et al., 2004).

In NSW, state intervention is provided through a series of state environmental planning instruments. This is the collective term used to encompass State Environmental Planning Policies (SEPPs), Regional Environmental Plans (REPs), Local Environmental Plans (LEPs), the *Environmental Planning and Assessment Act (EP&A) 1979* (NSW), and the *Environmental and Planning Assessment Regulation* (NSW Legislation, 2023). Other influential documents include ministerial orders,

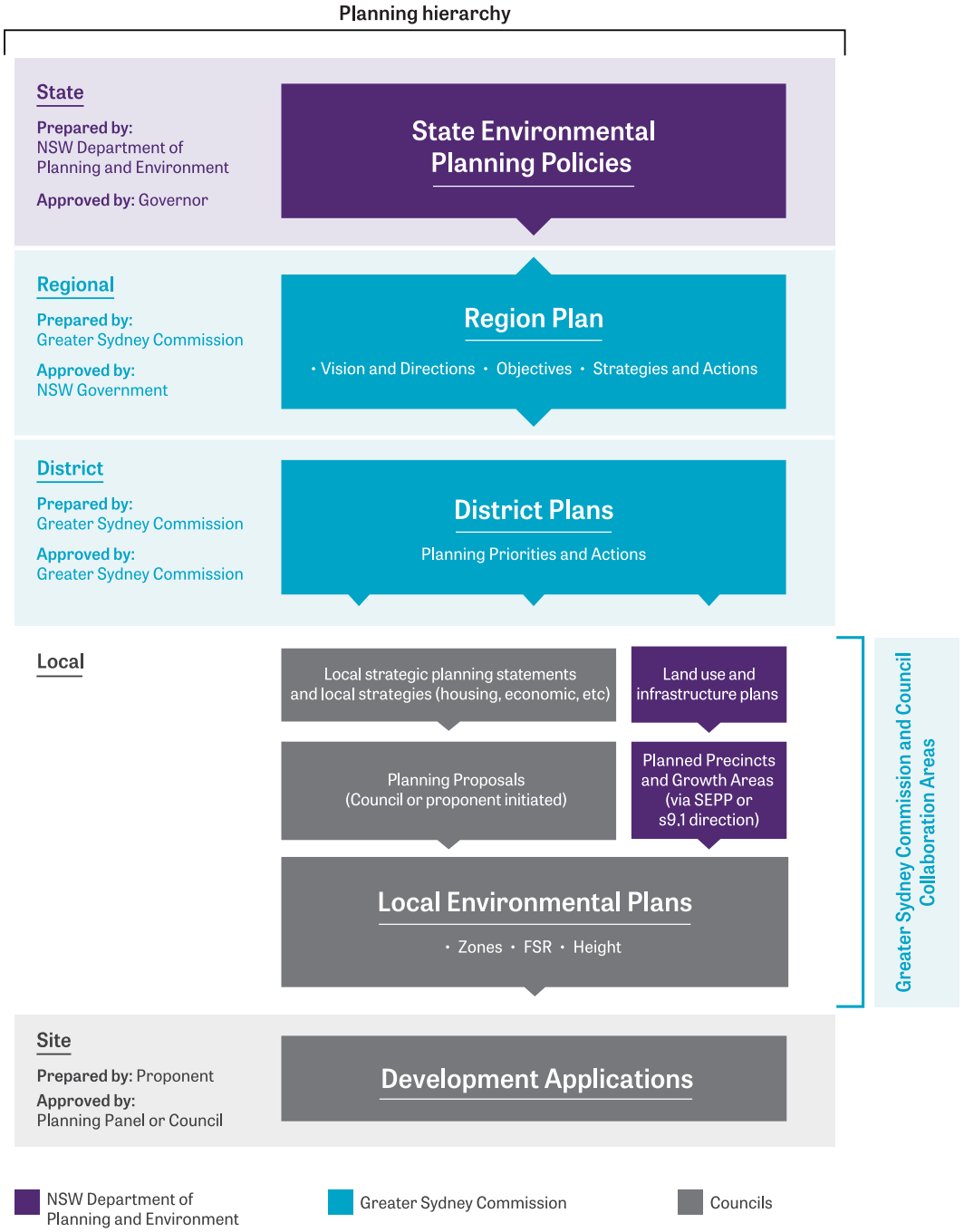
planning circulars, Premier's Priorities and various other framework documents, as outlined in the NSW Department of Planning, Housing and Infrastructure (DPHI) *Strategic Planning Toolkit* (DPHI NSW, 2024r). Further guideline documents in relation to NSW place-based planning that are not of a legislative nature are administered by the Government Architect NSW (DPHI NSW, 2024e). Local intervention is administered through local councils, using Local Environmental Plans, legislative requirements and other administrative obligations that are informed by community feedback mechanisms (DPHI NSW, 2024q, 2024r). Since the 1980s, there has been some form of independent planning commission set up under the Environmental Planning and Assessment Act 1979 as a counterweight to implementation challenges in relation to contentious state significant development (IPC NSW, n.d.).

According to the *Strategic Planning Toolkit*, the aim of strategic policies and plans is to outline long-term goals and identify how they can be achieved (DPHI NSW, 2024r). Strategic plans are designed to address areas of economic, social, environmental and land-use policy in relation to land-use planning, as it is commonly referred to in NSW. P. Burton (2017) offers a similar explanation of urban planning to that of Fingland (2015), stating that planning as a form of state intervention refers principally to land-use planning that influences social, economic and environmental outcomes.

At the time of primary data collection for this research, December 2021 to September 2022, the NSW environmental planning instruments constituted the following documents, as shown in Figure 5:

1. The *Environmental Planning and Assessment Act 1979* (NSW).
2. The *Environmental Planning and Assessment Regulation 2023* (NSW).
3. State Environmental Planning Policies (SEPPs).
4. Regional Environmental Plans (REPs).
5. Local Environmental Plans (LEPs).

Figure 5
Roles of planning authorities in Greater Sydney



Source: GSC (2018b).

Figure description: Figure 5 is a vertical flowchart. Sourced from *A Metropolis of Three Cities* (GSC 2018b). The topmost level of the flowchart is the State level, followed by the Regional, District and Local levels. The lowest level of the flowchart is the Site level. Below the labels for each level, the bodies responsible for the preparation and approval of planning documents at that level are listed. A

key assigns colours to the planning entities that have jurisdiction over each level. NSW Department of Planning and Environment = purple, Greater Sydney Commission = blue, and Councils = grey (referred to in this research as local councils). Each level of the planning hierarchy contains a text box that is shaded one of these 3 colours and associated with a planning entity. The exception is the Local level, which contains several text boxes shaded purple or grey. The flowchart identifies the text boxes in the Local level as “Collaboration Areas” between the NSW Department of Planning and Environment and local councils. Each text box in the flowchart contains the title of a planning document. For some documents, a list under the title indicates the document’s focus areas. Arrows emanating from the text boxes identify the direction of flow between the different levels of the planning hierarchy. The chart shows that, at the NSW State level, state and environmental planning policies are prepared by the NSW Department of Planning and Environment and approved by the NSW Governor. At the regional level, region plans are prepared by the Greater Sydney Commission and approved by the NSW Government. Region plans focus on vision and directions, objectives and strategies, and actions. At the district level, district plans are both prepared and approved by the Greater Sydney Commission. District plans focus on planning priorities and actions. At the local level, local strategic planning statements and local strategies inform planning proposals, which then inform local environment plans. Concurrently, land use and infrastructure plans inform planned precincts and growth areas, which then inform local environment plans. Local environment plans focus on zones, floor-space ratios and height. At the Site level, development applications are prepared by proponents and approved by a planning panel or council. The arrows indicating the direction of flow between NSW planning levels suggest that the flow is almost always one-way and top-down. The exception is at the regional level, where the region plan flows both up to the state level and down to the district level.

A Metropolis of Three Cities is the overarching plan guiding all other NSW environmental planning instruments collaborated upon, administered or adhered to by the federal, state and local government entities that have jurisdictional responsibility across Sydney. The precinct-level state environmental planning policies of the *Eastern Harbour City Precinct SEP* (DPIE NSW, 2021c), *Central River City Precinct SEP* (DPIE NSW, 2021b) and *Western Parkland City Precinct SEP* (DPIE

NSW, 2021e) fit between the *A Metropolis of Three Cities* document (GSC, 2018b) and the *Five District Boundary Plans* (GSC, 2018a). At the time of writing (May 2024), the precinct plans were under the remit of the NSW Department of Planning, Housing and Infrastructure owing to the Greater Cities Commission being disbanded in 2023. Precinct plans provide a place-based strategic planning approach to growth across Sydney and set priorities and actions for specific areas using the vision outlined in the *A Metropolis of Three Cities* (GSC, 2018b).

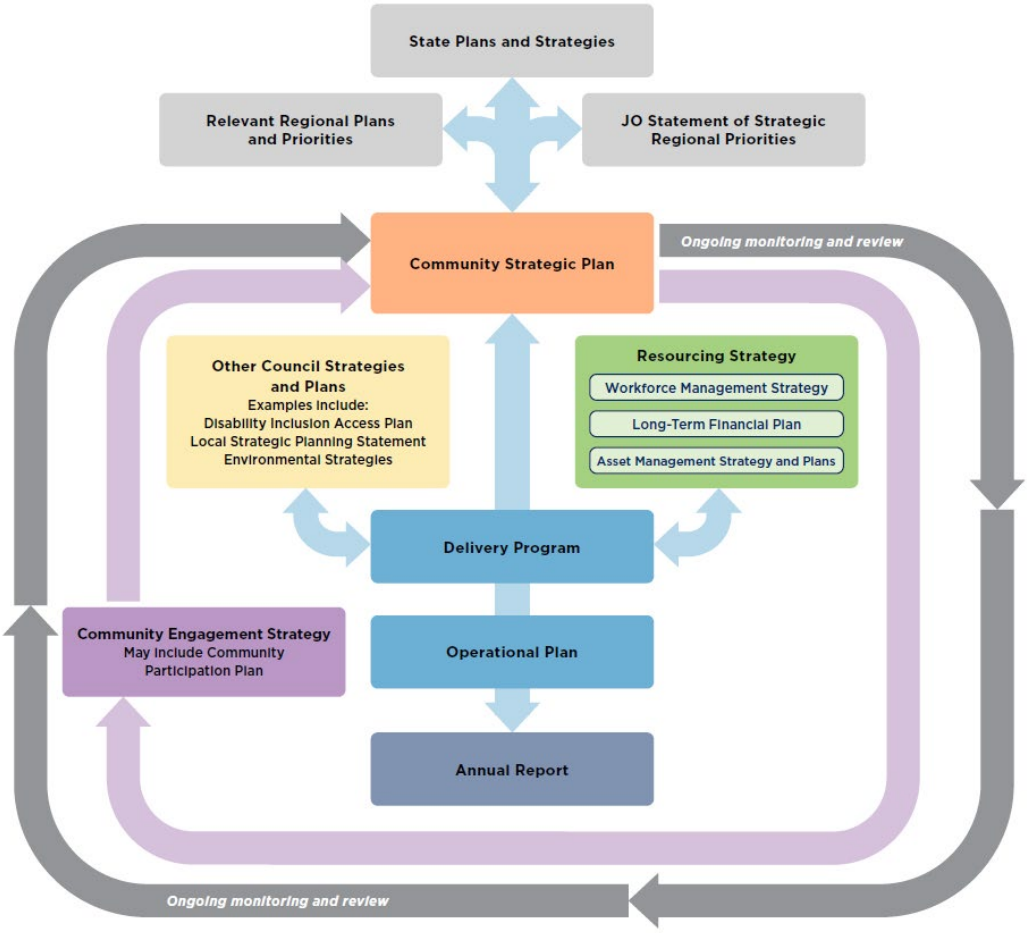
The district plans implement the vision and objectives of the *A Metropolis of Three Cities* at a district level. The district plans mirror the aims of the *Five District Boundaries*, and these plans are a 20-year plan designed to bridge the *A Metropolis of Three Cities* strategy, with the hierarchy of other frameworks in place to encourage adequate growth across Sydney. As stated above, these include the three-precinct level State Environmental Plans and local planning to inform Local Environmental Plans, local strategic planning statements (LSPSs), community strategic plans and the assessment of planning proposals. The aim of district plans is to aid local council in planning and delivering for growth and change and align local planning strategies to place-based outcomes as explained in the *Strategic Planning Toolkit* (DPHI NSW, 2024r).

According to the NSW Department of Planning, Housing and Infrastructure *Strategic Planning Toolkit* (DPHI NSW, 2024r), LSPSs are designed to fit into the same timeline as in the district plans. Local Strategic Planning Statements describe current and future priorities for land use and community and physical infrastructure in an LGA. They guide the application of land-use zones set down in councils' Local Environmental Plans. State government entities are largely reliant on local councils to implement the planning priorities and actions of the state's regional and district plans through their Local Environmental Plans and Local Strategic Planning Statements.

A local environmental plan is a statutory environmental planning instrument used by local council to guide planning decisions for LGAs through zoning and development controls. Local Environmental Plans provide a local framework for the way land can be developed and used and are the main planning tool that shapes a community by ensuring local development is carried out appropriately and linked to the *Environmental Planning and Assessment Act 1979* (NSW) (DPHI NSW, 2024r).

The Integrated Planning and Reporting (IP&R) Framework is made up of two main documents; the *Integrated Planning and Reporting Handbook* (OLG NSW, 2021c) and the accompanying technical guidelines, *Integrated Planning and Reporting Guidelines* (OLG NSW, 2021b). The Integrated Planning and Reporting framework is designed to incorporate the aspirations of the community into the aspirations of the local council. Therefore, the framework includes a suite of integrated plans that set out a vision and strategic actions to achieve those goals over a period of at least 10 years. It involves a reporting structure to communicate progress to local council and the community, as well as a structured timeline for review to ensure the goals and actions are still relevant. Figure 6 illustrates how the different elements interact.

Figure 6
NSW Integrated Planning and Reporting framework for local councils



Source: OLG NSW (2024a)[18].

Figure description: Figure 6 is a vertical flowchart with several horizontal branches. Sourced from *The Integrated Planning and Reporting (IP&R) Framework* (OLG NSW 2024a). The topmost level of the flowchart has 4 text boxes: State Plans and Strategies = grey, Relevant Regional Plans and Priorities = grey, Statement of Strategic Regional Priorities = grey and Community Strategic Plan = orange. Light blue arrows indicate the direction of flow between these text boxes. Below the orange text box are 3 more text boxes: Delivery Program = medium blue, Operational Plan = medium blue and Annual Report = dark blue. Light blue arrows indicate the direction of flow between these text boxes. Two additional text boxes are placed to the left and right of the light blue Delivery Program text box. Other Council Strategies and Plans = yellow, and Resourcing Strategy = green. Light blue arrows indicate the flow direction between these text boxes and the medium blue Delivery Program text box. The

yellow Other Council Strategies and Plans text box lists the following examples: Disability Inclusion Access Plan, Local Strategic Planning Statement and Environmental Strategies. The green Resourcing Strategy text box lists: Workforce Management Strategy, Long-Term Financial Plan, Asset Management Strategy and Plans. Grey and purple bars emanate from either side of the orange Community Strategic Plan text box and encircle the yellow, green and blue text boxes. The larger grey circle is labelled Ongoing Monitoring and Review, and the purple circle is labelled Community Engagement Strategy – May Include Community Participation Plan. The chart shows the flow between the various Plans, Strategies and Programs depicted is generally two-way. The 4 text boxes at the top of the flowchart – State Plans and Strategies, Relevant Regional Plans and Priorities, Statement of Strategic Regional Priorities and Community Strategic Plan – all flow into each other. The orange and blue boxes at the base of the chart – Community Strategic Plan, Delivery Program, Operational Plan and Annual Report, likewise flow into each other. The yellow and green boxes also have bidirectional flow with the medium blue Delivery Program text box.

4.2.1 Legislative frameworks

The primary legislative framework for the NSW planning system is the *Environmental Planning and Assessment Act 1979* (NSW) which is supported by planning circulars, policy guidelines and ministerial directions and orders administered by the Department of Planning, Housing, and Infrastructure (DPHI NSW, 2024p).

The five acts passed by of the Parliament of New South Wales that are of most relevance to the provision of parks across Sydney are:

1. The *Environmental Planning and Assessment Act 1979* (NSW).
2. The *Greater Cities Act 2022* (NSW) (now repealed).
3. The *Local Government Act 1993* (NSW).
4. The *Crown Land Management Act 2016* (NSW).
5. The *Greater Sydney Parklands Act 2022* (NSW).

The *Environmental Planning and Assessment Act 1979* (NSW) covers a range of responsibilities related to the legislative enforcement of local park provision via the objectives and frameworks built into the Act as described above.

Local councils are responsible for the management of land that is classified as Crown land. There are two types of Crown land: community land and operational land. This research focused on community land, specifically the sub-category of parks, as categorised under section 36 of the *Local Government Act 1993* (NSW). Community land is legislatively subject to a set of decision frameworks. Under section 36G of the Act ('Core objectives for management of community land categorised as a park'), there are three considerations, as follows:

1. To encourage, promote and facilitate recreational, cultural, social and educational pastimes and activities.
2. To provide for passive recreational activities or pastimes and for the casual playing of games.
3. To improve the land in such a way as to promote and facilitate its use to achieve the first two core objectives for its management.

4.3 Current metropolitan strategies

The current metropolitan strategy for Sydney is *A Metropolis of Three Cities* (GSC, 2018b) which has gone through several administrative changes since its inception. At the time of writing (May 2024), the *A Metropolis of Three Cities* document is under the remit of the NSW Department of Planning, Housing and Infrastructure. The *A Metropolis of Three Cities* document presents a spatially imaginative formula of three cities: the Eastern Harbour City, the Central River City, and the Western Parklands City (GSC, 2018b) as provided in Figure 7.

Figure 7
Map of the three cities included in the *A Metropolis of Three Cities* plan

Source: GSC (2018b).

Figure description: Figure 7 shows a land-use map of Greater Sydney and immediate surrounds. Sourced from *A Metropolis of Three Cities* (GSC 2018b). The map indicates major roads and maritime boundaries = various colours, national parks and state forests = green, waterways = blue, and other areas = beige. The map is overlaid with administrative boundaries based on data from the ABS. The boundaries roughly divide the region of Greater Sydney into 3 cities: Western Parkland City, Central River City and Eastern Harbour City. The boundary of each city is shaded a different colour, which corresponds to that area's label colour. Western Parkland City's boundary and label = red, Central River City's boundary and label = orange, and Eastern Harbour City's boundary and label = yellow. Within the 3 areas, hubs are marked with a black dot and

> labelled. One main hub in each city is marked with a larger dot, which is the same colour as the city's boundary and labelled in larger, capitalised text. The map loosely indicates that the 3 cities, Western Parkland City, Central River City and Eastern Harbour City, cover the Sydney Metropolitan Area. The 3 cities centres are roughly equal in size. Western Parkland City is the furthest west of the 3 cities. It contains the main hub of Western Sydney Airport and the smaller hubs of Penrith, Liverpool and Campbelltown. Central River City is centrally located. It contains the main hub of Parramatta and the smaller hubs of Blacktown and Olympic Park. Eastern Harbour City is the furthest east. It contains the main hub of Sydney City and the smaller hubs of Northern Beaches, St Leonards and Sydney Airport.

Table 11 is an overview of the Greater Cities Commission, which was in place when this research took place but has since been disbanded.

Table 11
Timeline of key events from the history of the Greater Cities Commission

Year	Events
2015	The Greater Sydney Commission Act 2015 (NSW) was passed by the NSW Parliament and the Greater Sydney Commission was formed.
2016	The first Six District Plans draft document was released for the Greater Sydney region. It encouraged feedback on the proposed vision for Greater Sydney to 2036. The plans were crafted to explore the unique opportunities and challenges of each of the districts.
2017	The Our Greater Sydney 2056: Draft Greater Sydney region plan (GSC, 2017) was exhibited to the public, introducing the idea of Greater Sydney as 3 connected cities. The original 6 districts were then reimagined into 5 districts by combining the Southwestern and Western districts to form a single entity named the Western City District. The remaining 4 district boundaries remained intact, with the Central Western District being renamed the Central City District and the Central District being renamed the Eastern City District. The South District and the North District remained the same. The renaming and adjustment of the 5 districts were designed to better reflect their geographic allocation in line with the three-cities concept and the intended political collaboration (the Western Sydney City Deal) (DIRDC, n.d.; DPIE, 2021f). A plan for each district was also released which broke down the metropolitan-wide priorities into district-dependent characteristics and aims.
2018	The final plan, A Metropolis of 3 Cities (GSC, 2018b), was endorsed and finalised. The aim of the strategy plan was to rebalance growth and deliver benefits more equally to city dwellers across Greater Sydney. The 5 district plans were also published (GSC, 2018a).
2019	Local Strategic Planning Statements required by local councils were developed to monitor and report on the implementation of the region and city plans.
2020	The City-Shaping Impacts of COVID-19 (GSC, 2020) (COVID-19 disrupted established patterns of life and work). The GSC analysed the first 6 months of available data to produce the report, identifying 9 critical focus areas of city-shaping fundamentals to recovery and resilience.
2022	The Greater Cities Commission was formed and The Six Cities Region Discussion Paper: Delivering global competitiveness and local liveability (GCC, 2022) was released. In March 2022, the Greater Sydney Commission Act 2015 (NSW) was amended to become the Greater Cities Act 2022 (NSW), which changed the Greater Sydney Commission to the Greater Cities Commission and expanded the geographic remit of the agency.
2023	The Greater Cities Commission was disbanded at the end of the fiscal year under a change of government in NSW and at the beginning of July was absorbed into the NSW Department of Planning and Environment (DPE).

Source: Author. Adapted from the defunct website of the Greater Cities Commission (2023), and the Audit Office of NSW (2023) and supplemented with resources from the Greater Sydney Commission suite of strategies (GCC, 2022; GSC, 2017, 2018a, 2018b, 2020) and the accompanying repealed legislation, the *Greater Sydney Commission Act 2015* (NSW) and the *Greater Cities Act 2022* (NSW).

Table description: Table 11 shows a timeline of key events in the history of the GCC from 2015 to 2023. Data is adapted from the defunct GCC website and supplemented by other sources, namely, the Audit Office of NSW, the Greater Sydney Commission documentation and the accompanying legislation. The table has 2 columns and 9 rows, including the header row. The first column heading = Year and the second column heading = Events. Each row contains a year and a corresponding short description of an event.

The aim of the three-cities concept was to balance the inequities regarding planning and infrastructure traditionally experienced across Sydney and to create three unique cities (GSC, 2018b). The metropolitan strategy for Sydney is intended as a framing document designed to be supported by multi-tier strategies, government agencies, public/private partnerships, spatial hierarchies and means of implementation. It was the first document in NSW to combine land use, transport and infrastructure planning between the three tiers of government and across NSW state government agencies, as since reflected in the now repealed *Greater Cities Act 2022* (NSW), the *Future Transport Strategy 2056* (TFNSW, 2020)[19], the *State Greater Sydney Services and Infrastructure Plan* (TFNSW, 2018) and with the *Building momentum – State Infrastructure Strategy 2018-2038* (Infrastructure NSW, 2018) also playing a supporting role[20]. While the strategic framework put in place by the Greater Sydney Commission is largely intact, the creation and then disbanding of the independent planning authority is a direct symptom of the highly politicised nature of planning in NSW.

In this research, the *A Metropolis of Three Cities* (GSC, 2018b) strategy serves a purpose beyond a quantifiable boundary to that of ensuring that the future of Sydney remains relevant to its population and their needs, including the provision of enough parks to help keep Sydney inhabitants healthy and the city functioning as it should. As recounted in Scanlan (2019) and Table 11, prior to the *A Metropolis of Three Cities* plan, Sydney was divided into five districts: Central City, Eastern City, North, South and Western City (GSC, 2018a). The Western City District was geographically the largest of the five and today makes up the Western Parkland City. According to the GSC, the unique attributes and challenges faced by the Western Parkland City necessitated a collaboration between all levels of government to address and ideally rebalance some of the inequities faced by the region compared to the Eastern Harbour City and, to a lesser extent, the Central River City. This initiative was known as the Western Sydney City Deal (WSCD), a partnership between the federal government, the NSW government and the eight LGAs of the Western City District, namely, the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly (DIRDC, n.d.; DPIE, 2021f). A map of the various jurisdictional boundaries overlaying the Greater Sydney region is provided in Appendix C.

There are 10 directions underpinned by 40 objectives in the *A Metropolis of Three Cities* document (GSC, 2018b[21]), many of which can be met or enhanced through the provision of local parks or other urban greening initiatives. Direction Eight, “A City in its Landscape” speaks directly to valuing and the provision of greenspace and landscapes, as does Direction Five, “A City of Great Places”. Most of the other directions and objectives in the document would directly benefit from local park provision and urban greening initiatives, including infrastructure, housing and strengthening the economy.

In theory, the linking in the *A Metropolis of Three Cities* (GSC, 2018b) document of park provision with the benefits that parks provide to society is not problematic. As noted throughout this thesis there is ample research, project examples, and policy documentation and funding programs supporting the benefits and delivery of open space outcomes across Sydney.

It stands to reason that just as an urban greening project can be mapped to the directions and objectives of the *A Metropolis of Three Cities* document (GSC, 2018b), so too can Direction Eight and the objectives of urban greening, open space provision and landscape enhancement be applied to other directions and objectives outlined in the strategy. For example, since urban greening initiatives are beneficial to the economy, they can be applied to strengthening the outcomes of Direction Six, ‘A Well-Connected City’, and Direction Seven, ‘Jobs and Skills for the City’ (K. Bowen & Lynch, 2017; J. Byrne & Sipe, 2010; G. Thomson et al., 2019).

4.4 Policy frameworks for open space provision

Open space provision in Sydney is largely overseen by the NSW Department of Planning, Housing and Infrastructure (DPHI), the Greater Sydney Parklands and local councils. Other agencies that have a stake in how open space is provided in Sydney include the Government Architect NSW, the NSW Office of Sport and, to a lesser extent, Sydney Water, Local Government NSW, the NSW Office of Local Government and Transport for NSW. Increasingly, Transport for NSW is becoming more involved with public space provision as evident through the *Future Transport Strategy 2056* (TFNSW, 2020) and more recently via the *Great Places Toolkit* (TFNSW, 2024a) and the inheritance of the *NSW Public Spaces Charter* (DPIE NSW, 2021d) from the former Department of Planning, Industry and Environment. What all

these government agencies have in common when considering public space is, how open space needs to fit into the existing frameworks of civic life, how urban greening plays an essential role and how it is expected to be provided for public benefit. During the years it operated, the Greater Cities Commission also had a stake in open space provision. The focus of these state government entities is moving toward a more integrated approach between the public realm and open space. Therefore, their acknowledgement within this research as having a primary, or more minor role in park provision is fitting, particularly as Sydney densifies and more innovative approaches to supplement traditional twentieth-century notions of park provision is required, of which there is little choice than for state government entities not directly involved with open space provision to take responsibility.

This section discusses policy documents geared toward improving open space provision in NSW. A commonality across the documentation is the acknowledged value, social and biodiverse benefits of resourcing public space, open space and, of most relevance to the focus of this research, park provision to the health, function and sustainability of the community now and into the future. Equally significant, the documents note the challenges to open space provision. These include lack of appropriate funding, lack of land availability, competition for adequate resourcing for amenities, a lack of priority given to open space compared to other infrastructures, siloed approaches to open space provision, and tension between community demand and government organisation capacity to deliver in line with community expectations. The value of open space from a government policy perspective is changing, as evidenced by the ever-increasing number of policy and guideline documents devoted to urban greening of public space and, more specifically, open space provision. Increasingly, there is a focus on diversification of park provision and innovative designs/features are showcased. These include ideas that encourage greater connectivity, biodiversity, mixed-use areas and broader urban greening and micro-scale place-based outcomes, culminating in a cost-benefit analysis framework. Further, NSW based guidelines and approaches for working with Indigenous ways of Country are emerging as demonstrated through the Government Architect NSW guide titled, *Better Placed – Connecting with Country Framework*: *Good practice guidance on how to respond to Country in the planning, design and delivery of built environment projects in NSW* (GA NSW, 2023). The policy documentation is

increasingly providing more prescription through the various case study examples and place-based approaches (DPE NSW, 2023; GA NSW, 2020, 2023; NSW Government, n.d.-a). As to whether this is enough in practice, is yet to be seen.

Table 12 and Table 13 are divided into primary and secondary NSW policy documents. This is to reflect how each is responsible for open space planning relevant to this research. The NSW policy documents sampled in Table 12 are considered directly responsible for open space urban planning outcomes. Documents are mostly concerned with Metropolitan Strategy, Standards of Provision, Urban Design for Greener Places, and Local Strategy. The policy documents sampled in Table 13, although closely related to open space planning outcomes, are considered one step removed; they contribute to and inform said open space outcomes through implementation. Documents are more closely aligned with Infrastructure rather than Metropolitan or Local Strategy. Documents are clustered in alphabetical order by government entity and publication title.

Table 12
List of primary planning documents relating to open space provision in Sydney

Organisation	Document	Infrastructure	Metropolitan Strategy	Standards of Provision	Urban Design for Greener Places	Local Strategy
Department of Planning and Environment NSW	Framework for valuing green infrastructure and public spaces (DPE NSW, 2023)		✓	✓	✓	✓
Department of Planning and Environment NSW[22]	Local strategic planning statements (DPE NSW, 2018)	✓		✓	✓	✓
Department of Planning and Environment NSW	Public open space strategy for NSW (DPE NSW, 2022)		✓	✓	✓	
Department of Planning, Housing and Infrastructure NSW	Biodiversity and conservation SEPP (DPHI, 2024b)	✓	✓	✓		
Department of Planning, Housing and Infrastructure NSW	Sydney Green Grid (DPHI NSW, 2024s)	✓	✓		✓	
Department of Planning, Industry and Environment NSW	A 50-year vision for Greater Sydney's open space and parklands (DPIE NSW, 2021a)		✓	✓	✓	✓
Greater Sydney Commission	Five district plans (GSC, 2018a)	✓	✓			✓
Greater Sydney Commission	Greater Sydney Regional Plan – A	✓	✓			

Organisation	Document	Infrastructure	Metropolitan Strategy	Standards of Provision	Urban Design for Greener Places	Local Strategy
	Metropolis of Three Cities (GSC, 2018b)					
Government Architect NSW	Greener Places (GA NSW, 2020)		✓		✓	✓

Source: Author.

Table 13
List of secondary planning documents relating to open space provision in Sydney

Organisation	Document	Infrastructure	Metropolitan Strategy	Standards of Provision	Urban Design for Greener Places	Local Strategy
Department of Customer Service NSW	NSW Government's Smart Infrastructure Policy (DCS NSW, 2020)	✓	✓	✓	✓	✓
Department of Planning, Industry and Environment NSW	NSW Public Spaces Charter (DPIE NSW, 2021d)	✓			✓	
Department of Planning, Industry and Environment NSW	Smart Places Strategy (DPIE NSW, n.d.)					
Department of Premier & Cabinet NSW	NSW Premier's Priorities (DPC NSW, 2019)	✓				
Government Architect NSW	Better Placed – Biodiversity in Place (GA NSW, 2024)	✓			✓	
Government Architect NSW	Connecting with Country Framework (GA NSW, 2023)	✓			✓	✓

Source: Author.

Table description: Table 12 and Table 13 list primary and secondary planning documents relating to open space provision in Sydney from 2018 to the time of writing (May 2024). The documents are clustered into alphabetised government organisation groupings. Table 12 has 7 columns and 11 rows, including the header row. Table 13 has 7 columns and 7 rows, including the header row. In both Table 12 and Table 13, the first column heading = Organisation, the second column heading = Document, the third column heading = Infrastructure, the fourth column heading = Metropolitan Strategy, the fifth column heading = Standards of Provision, the sixth column heading = Urban Design for Greener Places and the seventh column heading = Local Strategy. For each document listed in the second column of each table, corresponding ticks indicate which of the topics listed in columns 3 to 7 are relevant to that document. The tables show that primary planning documents are mostly concerned with Metropolitan Strategy, Standards of Provision, Urban Design for Greener Places, and Local Strategy. Secondary documents are more likely to be concerned with Infrastructure (5 out of 6 documents) and Urban Design for Greener Places (4 out of 6 documents).

As repeatedly noted throughout this thesis, the importance of open space provision is not in question, as government policy documents and academic research alike tend to agree thematically. Open space provision makes for better cities and better city-dweller outcomes (Corkery & Marshall, 2018; GSC, 2018b), yet with dwindling land supply, increases in hard permeable surfaces, financial constraints, competing infrastructure priorities and land-use functions, competing community demands and uses and political and developer demands, many challenges remain.

As noted throughout this thesis, open space struggles to gain traction as a value-add proposition to city-shaping discourse and delivery when pitted against other infrastructure priorities. Urban growth is complex, with competing and contradictory priorities that are largely driven by direct economic and market interests. This means that parks are rarely identified as a high-priority infrastructure compared to other urban resourcing requirements and demands (LG NSW, 2018). From a government policy perspective, there is a great deal of discussion and documentation regarding the lack of priority afforded to open space and the potential means of measurement so that it can be included and valued more highly against other infrastructures. One such example is provided by Local Government NSW (LG NSW) in their 2018 response titled *Draft Submission on the Draft Greener Places Policy* (LG NSW, 2018) to the *Draft Greener Places – Establishing an Urban Green Infrastructure Policy for New South Wales* (GA NSW, 2017) (hereby referred to as *Draft Greener Places)*. The response by Local Government NSW highlights tensions between government organisations regarding the lack of priority afforded to greenspace provision. Local Government NSW argue that while state government agencies such as Roads and Maritime Services (RMS) find existing greenspace available and cheaper than private land, not enough land is safeguarded for green infrastructure, including open space (LG NSW, 2018).

Over recent years, the NSW state government has worked toward building the capacity for open space to be valued similarly to other infrastructures, as illustrated by the slew of documentation in the lead-up to the 2023 release of the cost benefit analysis *Framework Valuing Green Infrastructure and Public Spaces* (DPE NSW, 2023) which provides a standardised means to identify and quantify costs and benefits associated with the provision of green infrastructure and public spaces. For example, the *Draft Greener Places* (GA NSW, 2017) policy stated that open space

needed to be recognised as an asset class within its own right and equal to that of other infrastructure. The policy argued that the traditional siloed approach of infrastructure containing a green component needed to be better integrated so that open space is embedded earlier and with greater consideration to the value it provides (GA NSW, 2017). This is a common refrain by the Government Architect across their documentation.

Since then, the *Draft Greener Places* policy (GA NSW, 2017) has been superseded and expanded upon, as identified through the Government Architect *Greener Places* (GA NSW, 2020). The *Public open space strategy for NSW* (DPE NSW, 2022) explains that to be recognised as an infrastructure, open space must be measured and be treated as infrastructure and fit into a cost/benefit analysis and commodity that supports itself financially.

The *Public open space strategy for NSW* (DPE NSW, 2022) acknowledged that it had not always capitalised on state government investment potential regarding open space. The strategy recognised that while open space is highly valued by the population of NSW, the quality and quantity of open space varies between cities and towns due to a lack of policy and planning. Therefore, a more coordinated approach is needed to effectively deliver open space as an enhancement to major development (transport, hospitals, infrastructure) rather than as a secondary consideration or a negotiable entity.

4.5 Funding for open space

Of most relevance to this research are the funding mechanisms that support the provision of parks. NSW State government agencies and local councils have a range of different mechanisms for the supply of parks. Often parks are the result of a planning agreement between a developer and an authority; for example, planning agreements with the NSW state government are referred to as state voluntary planning agreements to differentiate them from local council planning agreements (DPHI NSW, 2024p). In this context, local councils rely on three main revenue streams to support the provision of parks across their jurisdictions:

1. Developer contributions for the initial funding or resources for new park provision.

2. State government grants for the provision of new parks.
3. Local council rates and user charges are collected to supplement park upkeep.

Sometimes developer contributions and state government grants are used to embellish existing parks, but this is context-dependent and local council rates cannot be spent on the creation of new parks. Local council capital works budgets for the establishment of new parks and operational budgets for the maintenance of local parks are procured, reported on and delivered separately and have different requirements. Operational budgets for local parks are not included in this analysis but they do emerge in the primary findings as having a role in the consideration of new parks for some local councils. This idea is discussed further in accordance with planners' perspectives in Section 6.3.4 "Park maintenance costs".

Funding for parks across Sydney is predominantly reliant on developer contributions and NSW state government grants[23]. Other revenue sources include the federal government through the current WSCD and public-private partnerships[24]. What is most relevant to this research are the funding mechanisms provided by government grants, developer contributions and, to a lesser extent, how the procurement rates by local councils influence local park provision.

4.5.1 Developer contributions

Planning agreements are a method of securing developer contributions. A planning agreement is a legal agreement between a developer and a planning authority, such as the NSW Minister for Planning and Public Spaces or local councils. The NSW development contributions system operates under the *Environmental Planning and Assessment Act 1979* (NSW) and the planning agreement policies encompass legislation, ministerial directions and practice notes. The Act provides the legislative framework for developer contributions while the *Environmental Planning and Assessment Regulation 2021* has further requirements relating to the making, amending and revocation of developer contribution plans, such as providing public notice and other procedural arrangements. The regulation is designed to provide greater transparency and accountability for how developer contributions are spent in NSW (DPHI NSW, 2024p).

Planning agreements can deliver or fund public amenities and services, affordable housing, transport or other infrastructure and conservation or enhancement of the natural environment. Developer contributions, also referred to as infrastructure contributions, or more broadly within this thesis as planning agreements, are based on various contexts and used interchangeably within policy documentation to mean different things. Unless otherwise stated, ‘developer contributions’ refers to local infrastructure contributions and ‘planning agreements’ refers to voluntary planning agreements (DPHI NSW, 2024p).

There are two types of developer contributions in NSW: one for state infrastructure and the other for local infrastructure. Developer contributions supplement the cost of delivering infrastructure to support new businesses, communities and homes. Each type of contribution is designed to offset the costs and services required to support new development and growing communities relevant to jurisdictional responsibilities and scale. This means each type of contribution is designed to fund or provide an amenity based on the likely service area of that amenity. In theory, it is the extent of required amenities and services generated by the development that triggers contributions, providing a value uplift to the vicinity as a result. For example, state voluntary planning agreements (DPHI NSW, 2024p) differ from special infrastructure contributions (DPHI NSW, 2024o).

State planning agreements are negotiated between a developer and the Minister for Planning to provide regional or state infrastructure such as transport, hospitals, schools and regionally significant open space (DPHI NSW, 2024p). Regional infrastructure contributions were replaced in June 2023 by the Housing and Productivity Contribution (DPHI NSW, 2024g) to create a more transparent and efficient means of planning and development for high-growth areas in NSW. By ‘complementing’ local infrastructure contributions, which are more local in scale, the state infrastructure contributions are aimed at ensuring broader themes of liveability and sustainability. The state infrastructure contributions apply to new residential, commercial, retail and industrial development across Greater Sydney as a high-growth area of NSW. They do not apply to the entire state.

The NSW state government sets the policy under which councils collect and administer contributions. Local planning agreements are negotiated between a developer and a local council to provide infrastructure that supports local

communities, such as local parks, community facilities, local roads, footpaths and stormwater drainage. Each council must keep a register of all planning agreements and make this register available to the public.

Of most relevance to this research is local developer contributions, of which there are two forms, because they are a primary means of park provision across Sydney. Section 7.11 contributions are charged where there is a demonstrated link between the development and the infrastructure to be funded. The second form is Section 7.12 levies (previously known as section 94A of the *Environmental Planning and Assessment Act 1979* (NSW), which are an alternative to Section 7.11 contributions, and are charged as a percentage of the estimated cost of the development. The maximum percentage that can be charged in most areas is 1%, although there are a few areas that charge more. Thematically across the literature, there is a consensus that developer contributions are inadequate in terms of both funding and providing public amenity.

4.5.2 Value of developer contributions

Developer contributions are one mechanism used in the provision of local parks across Sydney, yet there are significant differences between local councils as to the financial worth of developer contributions collected over any timeframe. It is assumed that the greater the total worth of developer contributions collected in a year, the greater the proportion of that total worth could be spent on local park provision. According to a recent report by the Australian parliament titled, *Developer contributions: How should we pay for new local infrastructure?* (APH, 2021), 88% of developer contributions in NSW went toward providing social infrastructure, but the breakdown of social infrastructure was not forthcoming. As the report states, data on developer contributions allocation is difficult to obtain. This is in part due to inconsistent reporting processes across Australian states but also because developer contributions are provided and allocated on a case-by-case basis (APH, 2021). Further, developer contributions are a contentious topic, and much of the information is sensitive in nature and therefore not publicly available. Therefore, it is difficult to gain access to the breakdown of developer contribution allocations.

Table 14 and Figure 8 respectively show the value of developer contributions (Applications Approved) from the *Time series data 2020-2021* (OLG NSW, 2024b)

collected by local councils as a proxy value of how much could be used for open space provision as part of the revenue allocation from the developer contribution[25]. This is based on the theory that a portion of the earnings by each local council paid by developers could be used on open space provision. This would exclude the value of voluntary planning agreements that were not part of the reported data. The table is designed to illustrate the difference in revenue based on developer contributions to individual local councils[26].

Table 14
Value of development applications approved 2019-2020 by LGA, ranked by magnitude

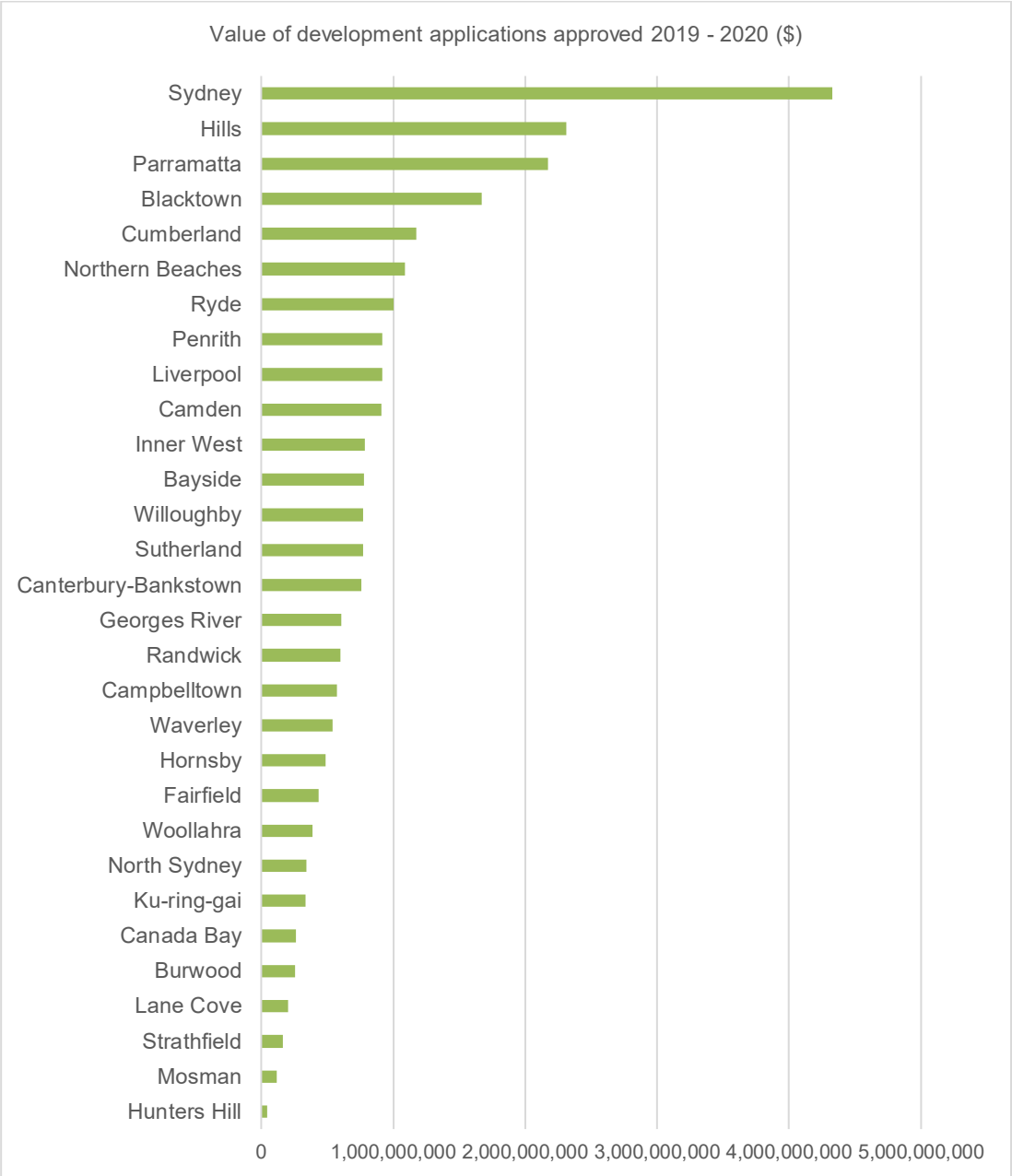
LGA	Value of development applications approved 2019 - 2020 ($AU)
Sydney	4,326,028,321
Hills	2,309,311,902
Parramatta	2,174,257,299
Blacktown	1,669,005,437
Cumberland	1,173,650,829
Northern Beaches	1,086,804,559
Ryde	1,002,914,048
Penrith	918,985,458
Liverpool	918,507,820
Camden	913,265,273
Inner West	783,133,559
Bayside	781,123,528
Willoughby	773,783,435
Sutherland	770,072,199
Canterbury-Bankstown	756,016,849
Georges River	609,670,611
Randwick	602,896,011
Campbelltown	571,112,105
Waverley	537,655,426
Hornsby	486,502,533
Fairfield	433,229,679
Woollahra	388,983,190
North Sydney	342,126,704
Ku-ring-gai	337,917,119
Canada Bay	263,963,161
Burwood	255,475,228
Lane Cove	203,181,127
Strathfield	162,286,618

LGA	Value of development applications approved 2019 - 2020 ($AU)
Mosman	119,638,727
Hunters Hill	44,647,422

Source: Author. Adapted from OLG NSW (2024b).

Table description: Table 14 shows the value of developer contributions 2019 – 2020 by LGA, ranked by amount (in Australian dollars). The data is from the *Time series data 2020-2021* (OLG NSW, 2024b). The table has 2 columns and 31 rows, including the header row. The first column heading = LGA and the second column heading = Value of development applications approved 2019 - 2020 ($AU). Of the LGAs that reported data for this period, the table shows that Sydney LGA had the highest value of development applications approved 2019 – 2020, a total of $4,326,028,321. Hunters Hill had the lowest value of development applications approved 2019 – 2020, a total of $44,647,422.

Figure 8
Value of development applications approved 2019-2020 by LGA, ranked by magnitude



Source: Author. Adapted from OLG NSW (2024b).

Figure description: Figure 8 is a horizontal bar graph. The data is adapted from the *Time series data 2020-2021* (OLG NSW, 2024b). The x-axis plots Value of development applications approved 2019-2020, in increments of $1,000,000,000. The y-axis plots LGAs, ranked by value of development applications. For each LGA on the y-axis, a horizontal green bar indicates the total value of development applications. The graph shows that, of the LGAs that reported data for this period,

> Sydney LGA had the highest value of development applications approved in 2019-2020, a total of $4,326,028,321. Hunters Hill had the lowest value of development applications approved 2019-2020, a total of $44,647,422. One LGA had more than $4 billion but less than $5 billion in development applications approved. That LGA was Sydney. Zero LGAs had more than $3 billion but less than $4 billion in development applications approved. Two LGAs had more than $2 billion but less than $3 billion in development applications approved. Those LGAs were the Hills and Paramatta. Four LGAs had more than $1 billion but less than $2 billion in development applications approved. Those LGAs were Blacktown, Cumberland, the Northern Beaches and Ryde. Twenty (20) LGAs had more than $0 but less than $1 billion in development applications approved. Those LGAs were Penrith, Liverpool, Camden, Inner West, Bayside, Willoughby, Sutherland, Canterbury-Bankstown, Georges River, Randwick, Campbelltown, Waverley, Hornsby, Fairfield, Woollahra, North Sydney, Ku-ring-gai, Canada Bay, Burwood, Lane Cove, Strathfield, Mosman and Hunters Hill.

4.6 Government grants

The NSW state government funding initiatives for open space reflect a broad range of public space amenity, uses, means of improvement, implementation and definition. These include active and passive recreational open spaces across a variety of uses and projects as diverse as waterways and foreshores, biodiversity restoration, stormwater runoff, provision of parks, trails and boardwalks, and other open space enhancement provisions, including urban greening initiatives (DPHI NSW, 2024j). Such projects are funded through several NSW state government agencies such as Transport for NSW or Local Government NSW, but predominantly revenue is administered by the Department of Planning, Housing and Infrastructure (formerly the Department of Planning and Environment).

Open space is seen by the NSW state government as a shared responsibility between tiers of government and across agencies. This is increasingly showcased by policy documents and through the range of NSW state grant initiatives. Of most relevance to this research were the projects directly related to new park provision. Upgrades to existing parks and high streets were seen as secondary themes, as they emerged as “somewhat significant considerations” in the research findings. Active

recreation areas such as trails and sporting fields also emerged as value-adding alternatives to traditional parks, according to community feedback mechanisms[27].

NSW government funding for open space is constantly evolving. At the time of writing this thesis (January 2019 and May 2024), there were multiple state-led initiatives designed to enhance green infrastructure and open space across Sydney. Several of these initiatives appeared to be in direct response to the pandemic and others were more aligned with broader priorities. Common to all these state government-led initiatives was the contribution to creating greener places in an otherwise densifying city and the shared recognition of how parks and other greenery, such as the tree canopy, add value to urban and public health alike. Most recently, these included: 1) the *Metropolitan Greenspace Program* (DPHI NSW, 2024h); 2) the *NSW Public Spaces Legacy Program* (DPHI NSW, 2024i); 3) the *Open Spaces Program* (DPHI NSW, 2024k); 4) the *Parks for People Program* (DPHI, 2024L)[28]; 5) the *Everyone Can Play Program* (DPHI NSW, 2024d); 6) the *Streets as Shared Spaces Program* (TFNSW, 2024b); 7) the *Precinct Support Scheme* (DPHI NSW, 2024m); 8) the *Green Our City Program* (DPHI NSW, 2024f; LG NSW, n.d.). Initiatives administered by other state government agencies related to green infrastructure or public space include shared-use arrangements, which are administered by the Department of Education – School Infrastructure NSW (SINSW) (DE NSW (Department of Education NSW), n.d.). Examining the range of grant initiatives provided by the state government and comparing them with successful local council uptake of these programs illustrates one means of open space provision, yet it also illustrates the different priorities and allocated resourcing mechanisms of local councils across Sydney.

4.6.1 Metropolitan Greenspace Program

The *Metropolitan Greenspace Program* was, at the time of writing (May 2024), an ongoing grant program that has been in operation since 1983 and the longest-running open space funding initiative administered by the NSW Government. The program commits funding to local councils across Sydney to improve regionally significant public open space. It also aligns with the *A Metropolis of Three Cities* (GSC, 2018b) and the *Sydney Green Grid* (DPHI NSW, 2024s) to ensure better-connected greenspace across Sydney. The *Metropolitan Greenspace Program* grants are offered as a dollar-for-dollar capital works initiative to local councils as a

means of contributing to the NSW metropolitan greenspace priority of the *Green Grid* and increasing access to accessible open space within 800m of city-dweller homes across Greater Sydney and the Central Coast (DPHI NSW, 2024h). The *Metropolitan Greenspace Program* funds urban greening initiatives that go beyond creating new open spaces or improving existing open space to include creating plans for new open space or improving existing open spaces and increasing urban forests.

4.6.2 NSW Public Spaces Legacy Program

The *NSW Public Spaces Legacy Program*, a $250 million investment in public space, was launched in 2020 in response to the COVID-19 pandemic. It was an economic stimulus package to unlock construction jobs, economic activity and broader public benefits. Funding was allocated to local councils based on local council grouping and land costs. According to the Department of Planning and Environment, more than 100 public spaces have been created since the program's launch, including new and improved walking and cycle paths, parks, trails, boardwalks, lookouts, foreshores, riverbanks, play spaces, civic plazas and outdoor event spaces. The program provided a financial incentive to local councils to comply with faster planning assessment times and processes, as administered by the DPE through its own local assessment acceleration program. The objectives of the program included:

1. Improved development assessment speeds and planning proposals (rezoning) to bring forward construction and the opportunity for jobs and economic activity in the short-to-medium term.
2. To support investment in the creation of high-quality public and open spaces to create a lasting community benefit.
3. To address critical open space shortfalls and to improve the quality of existing public and open spaces (DPHI NSW, 2024i).

4.6.3 Open Spaces Program

The *Open Spaces Program* is a three-year, $50 million grant program running from 2022 to 2025[29]. The program is linked with various initiatives to create better recreational open space, including urban park provision. Of most relevance to this research in relation to open space provision is the Places to Play sub-category of the

Open Spaces Program – an extension of the previous *Everyone Can Play Program*, which ran from 2018 to 2022. The *Open Spaces Program* is designed to align with the Premier's Priority of a 10% increase of open space being accessible within 800m of city dwellers' homes. The *Open Space program* is also aligned with a response to the pandemic, as it aims to capitalise on the pre-pandemic trend of park tourism by stimulating the visitor recreation economy for small businesses. It does this by creating high-quality open space that people want to experience and, by extension, to frequent surrounding small business while in the area. The *Open Spaces Program* aims to deliver high-quality open space through grant funding, pilot and demonstration projects and the creation of best-practice design guidelines. The objectives of the program note post-pandemic recovery as a goal, alongside community wellbeing, economic stimulation, free green infrastructure embedded into public space and bridging the gap for accessible places (DPHI NSW, 2024).

4.6.4 Parks for People Program

The *Parks for People Program* was a $50 million initiative between the state government and local councils to create better access to open space for people across Greater Sydney. Administered between 2020 and 2023 by the former Department of Planning and Environment, it is esteemed by the NSW state government as a successful example of involving the community in the co-design process for large urban parks to serve generations to come. The program involved seven large urban parks in total, three new ones and four upgrades, as listed in Table 15. At the time of writing (May 2024), several projects were already completed, highlighting the importance of greener public spaces by increasing the proportion of homes in urban areas within a 10-minute walk of quality green, open and public space by 10% by 2023 (DPHI NSW, 2024L).

Table 15
Parks for people park status

LGA	Name of park	Status
Fairfield	Carrawood Park	New and complete
Penrith	Tench Reserve	Upgrade and complete
The Hills	Beaumont Hills	Upgrade and complete
Northern Beaches	Nandi Reserve	Upgrade and incomplete
Liverpool	Leppington Park	New and incomplete
Parramatta	George Kendall Riverside Park	Upgrade and incomplete
Wollondilly	Appin Park	New and incomplete
Campbelltown	Glenfield Parklands	New and proposed

Source: Author. Adapted from DPHI NSW (2024L).

Table description: Table 15 uses data from the *Parks for People Program* (DPHI NSW 2024L). The table shows the status of parks across various LGAs. The table has three columns and nine rows, including the header row. The first column heading = LGA, the second column heading = Name of Park, and the third column heading = Status. Each row from row 2 – 9 lists an LGA and a park in their respective columns. The status column further indicates whether a park is new, upgraded, complete, incomplete, or proposed. The table indicates parks are located across Sydney and they are at differing stages of proposal, new build or upgrade. Some are complete and others are not.

4.6.5 Everyone Can Play Program

The *Everyone Can Play Program* was a $20 million commitment available to NSW local councils between 2018 and 2022 for new, and improvements to existing, play spaces in urban parks. The funding was provided to encourage the uptake of a broader initiative by the NSW Government to increase the accessibility of playspaces for people with disabilities (DPHI NSW, 2024d). Funding aligned to adherence by local councils to a set of inclusive principles administered by the former Department of Planning and Environment outlined in the recently updated *Everyone can play – A guideline to create inclusive playspaces* (NSW Gov, 2023).

4.6.6 Streets as Shared Spaces Program

The *Streets as Shared Spaces Program*, worth $15 million, was launched in May 2020 as a pilot to enable improvements across NSW during the pandemic. Administered over three rounds between 2020 and 2022, the program originally trialled temporary interventions and pop-ups that allowed local councils, the community and stakeholders to test innovative ideas (as a formal form of tactical urbanism) and then build the case for more permanent changes to streetscapes and the immediate surrounds. Grants of up to $500,000 were available to local councils to test the potential for permanent projects that would strengthen the amenity, accessibility and economic vitality of a site, using a place-based approach. There were three main objectives of the program:

1. To increase the amount and quality of public space to improve walkability and connectivity, enable day and night activity and increase footfall by the community.
2. To drive collaboration and partnerships between local council and other sectors (whether public, private, civic or community), to encourage a place-based approach to the planning and implementation of a space.
3. To enable long-term place-based changes by trialling innovative and creative approaches, partnerships and engagement mechanisms for the planning, use and functionality of public space (TFNSW, 2024b).

4.6.7 Precinct Support Scheme

The *Precinct Support Scheme* is a $85 million grant program for local infrastructure awarded to local councils supporting urban renewal and sustainable growth in planned precincts. In 2021, the *Precinct Support Scheme* funding was fully committed to such public and open space projects as public parks and open space improvements, streetscape and public safety improvements, local waterway rehabilitation and native revegetation, community facilities and planning and design (DPHI NSW, 2024m).

4.6.8 Green Our City Program

The *Green Our City Program* was a four-round $35.3 million initiative funded through the Department of Planning and Environment and administered by Local

Government NSW from 2019 to 2022 to help local councils across Greater Sydney enhance green cover and urban tree canopy in local parks, streets and neighbourhoods. The *Green Our City Program* is part of the Premier's Priority to reach 40% urban tree canopy cover across Greater Sydney by 2036. The program aimed to regulate the microclimate of immediate surrounds by creating more vibrant and cooler shadier places for city dwellers. It ran in two streams in 2020 that focused respectively on cooling suburbs and green innovations. Other program objectives included:

1. Mitigating climate extremes.
2. Decreasing the urban heat-island effect on a local and regional scale.
3. Promoting collaborative partnerships between levels of government, private sector and the community in enhancing tree coverage.
4. Supporting projects that would increase health equity outcomes, expand existing green cover and provide trees in places where there was traditionally less urban tree canopy (DPHI NSW, 2024f; LG NSW, n.d.).

4.6.9 Value of government grants

Table 16 and Figure 9 respectively show income received for the *Metropolitan Greenspace Program* (DPHI NSW, 2024h), the *NSW Legacy Program* (DPHI NSW, 2024i), the *Everyone Can Play Program* (DPHI NSW, 2024d) and *Share our Street Spaces Programs* (TFNSW, 2024b)[30] from 2018/2019 – 2022/2023, broken down into successful LGA uptake. The data indicates that some councils are either more successful or willing to apply for funding than others, and that different LGAs have different priorities based on their diverse characteristics. The diversity of local council uptake regarding state government grants aligns with planners' perspectives as discussed throughout Chapter 6.

Table 16
Income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018/2019 – 2022/2023, by LGA, ranked by magnitude

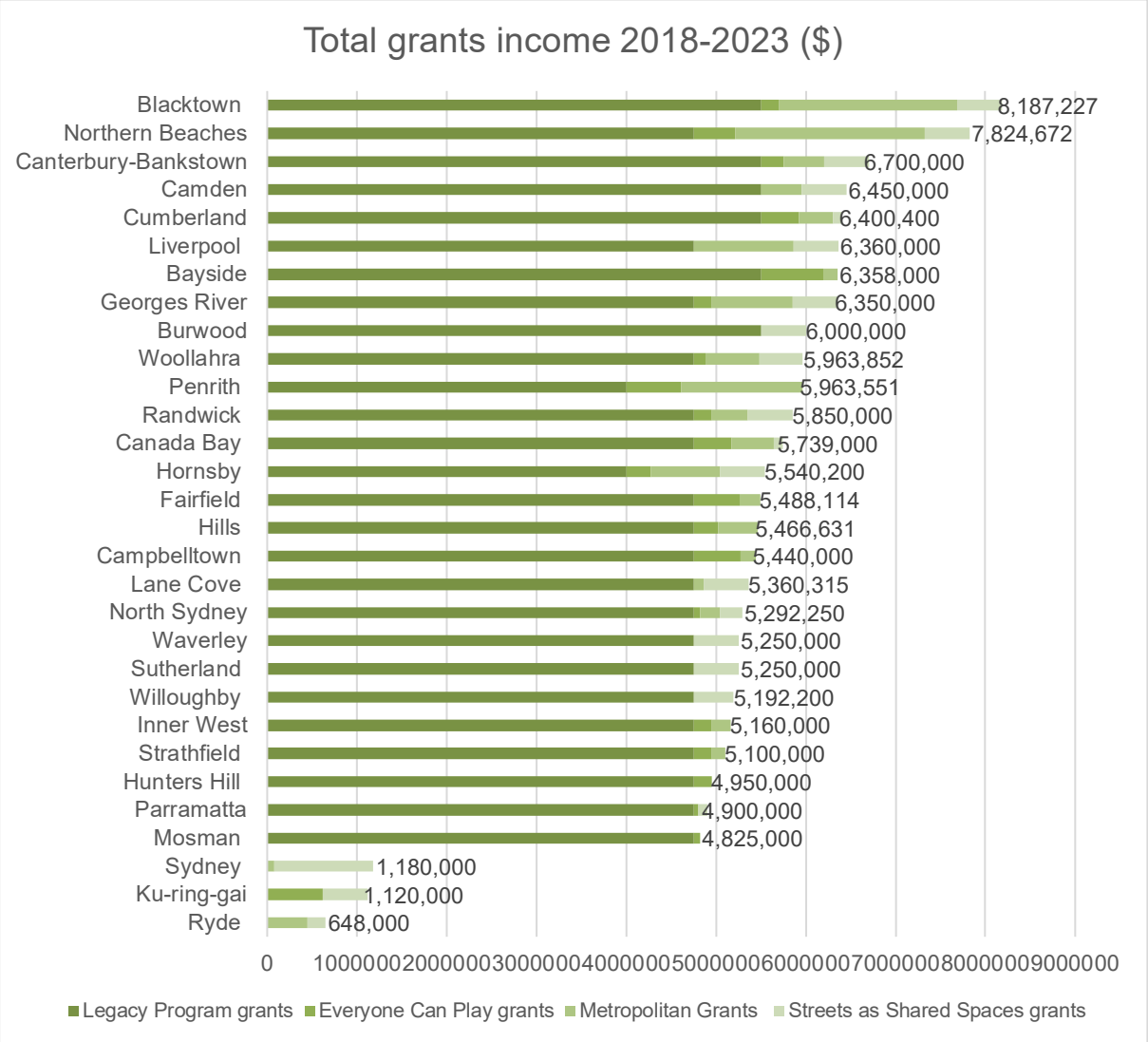
LGA	Metropolitan Greenspace	NSW Legacy	Everyone Can Play	Streets as Shared Spaces	Total
Blacktown	1,987,227	5,500,000	200,000	500,000	8,187,227
Northern Beaches	2,109,672	4,750,000	465,000	500,000	7,824,672
Canterbury-Bankstown	450,000	5,500,000	250,000	500,000	6,700,000
Camden	450,000	5,500,000	0	500,000	6,450,000
Cumberland	385,000	5,500,000	420,000	95,400	6,400,400
Liverpool	1,110,000	4,750,000	0	500,000	6,360,000
Bayside	165,000	5,500,000	693,000	0	6,358,000
Georges River	900,000	4,750,000	200,000	500,000	6,350,000
Burwood	0	5,500,000	0	500,000	6,000,000
Woollahra	606,000	4,750,000	127,852	480,000	5,963,852
Penrith	1,350,000	4,000,000	613,551	0	5,963,551
Randwick	400,000	4,750,000	200,000	500,000	5,850,000
Canada Bay	465,000	4,750,000	424,000	100,000	5,739,000
Hornsby	765,200	4,000,000	275,000	500,000	5,540,200
Fairfield	224,874	4,750,000	513,240	0	5,488,114
Hills	440,000	4,750,000	276,631	0	5,466,631
Campbelltown	165,000	4,750,000	525,000	0	5,440,000
Lane Cove	110,315	4,750,000	0	500,000	5,360,315
North Sydney	216,500	4,750,000	75,750	250,000	5,292,250
Sutherland	0	4,750,000	0	500,000	5,250,000
Waverley	0	4,750,000	0	500,000	5,250,000
Willoughby	0	4,750,000	0	442,200	5,192,200
Inner West	210,000	4,750,000	200,000	0	5,160,000
Strathfield	150,000	4,750,000	200,000	0	5,100,000
Hunters Hill	0	4,750,000	200,000	0	4,950,000
Parramatta	0	4,750,000	50,000	100,000	4,900,000

LGA	Metropolitan Greenspace	NSW Legacy	Everyone Can Play	Streets as Shared Spaces	Total
Mosman	0	4,750,000	75,000	0	4,825,000
Sydney	80,000	0	0	1,100,000	1,180,000
Ku-ring-gai	0	0	620,000	500,000	1,120,000
Ryde	450,000	0	0	198,000	648,000

Source: Author. Adapted from DPHI NSW (2024d); DPHI NSW (2024h); DPHI NSW (2024i); and TFNSW (2024b).

Table description: Table 16 shows data from the NSW DPE. Data is adapted from the DPHI NSW (2024d); DPHI NSW (2024h); DPHI NSW (2024i); and TFNSW (2024b). The table shows income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018/2019 – 2022/2023, by LGA, ranked by total income. The table has 6 columns and 31 rows, including the header row. The first column heading = LGA, the second column heading = Metropolitan Greenspace, the third column heading = NSW Legacy, the fourth column heading = Everyone Can Play, the fifth column heading = Streets as Shared Spaces and the sixth column heading = Total. The table shows that the LGA with the largest total income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018/2019 – 2022/2023 was Blacktown, which received $8,187,227. The LGA with the smallest total income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018/2019 – 2022/2023 was Ryde, which received $648,000.

Figure 9
Total income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018-2023, by LGA, ranked by magnitude



Source: Author. Adapted from DPHI NSW (2024d); DPHI NSW (2024h); DPHI NSW (2024i); and TFNSW (2024b).

Figure description: Figure 9 is a horizontal bar graph. The graph uses data from the DPE. Data is adapted from the DPHI NSW (2024d); DPHI NSW (2024h); DPHI NSW (2024i); and TFNSW (2024b). The graph plots income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018/2019 – 2022/2023. The x-axis plots Total grants income 2018-2023, in increments of $1 million. The y-axis plots LGAs, ranked by total income. For each LGA on the y-axis, the horizontal darkest green bar indicates *Legacy* Program grants, a darker green bar indicates *Everyone Can Play* grants, a lighter green bar indicates *Metropolitan* grants, and the lightest

green bar indicates *Streets as Shared Spaces* grants. Total income for each LGA is stated at the end of each bar. The graph shows that the LGA with the largest total income from the *Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs during 2018-2023 was Blacktown. The LGA with the smallest total income was Ryde. One LGA received more than $8 million. That LGA was Blacktown. Seven LGAs received more than $6 million but less than $8 million. Those LGAs were Northern Beaches, Canterbury-Bankstown, Camden, Cumberland, Liverpool, Bayside and Georges River. Nineteen LGAs received more than $4 million but less than $6 million. Those LGAs were Burwood, Woollahra, Penrith, Randwick, Canada Bay, Hornsby, Fairfield, the Hills, Campbelltown, Lane Cove, North Sydney, Sutherland, Waverley, Willoughby, Inner West, Strathfield, Hunters Hill, Parramatta and Mosman. Zero LGAs received more than $2 million but less than $4 million. Three LGAs received more than $0 but less than $2 million. Those LGAs were Sydney, Ku-ring-gai and Ryde.

The graph shows that the LGA with the largest total income from the *Metropolitan Greenspace*, *NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs during 2018-2023 was Blacktown. Blacktown is located in a large greenfield development in the Western Parklands City and has a less affluent population than more established areas. Blacktown's residential footprint is comparatively small compared to its local area boundary, owing to much of its greenspace provision designated for agricultural and parkland purposes.

The LGA with the second-highest total income was Northern Beaches. This council also has a large geographical footprint and is located on the coastal edge of Sydney in the Eastern Harbour City, extending from just north of the central CBD to Palm Beach. This LGA is surrounded by blue space and pockets of bushland and is considered highly affluent and well-resourced.

City of Sydney local council is different from other local councils across Sydney owing to its status as the economic capital of Australia, focused on the knowledge economy, business and economic activity, as opposed to residential density. Ku-ring-gai is located in a middle-ring suburban area. It is surrounded by national parks, is considered low-sprawl and highly affluent. Ryde Council is a smaller local council with pockets of high density and is also located in a middle-ring suburban location.

4.6.10 Shared use arrangements

A further option for local councils to provide more green infrastructure and open space and access for the community to local park amenity is shared-use arrangements. Shared arrangements collectively are designed as a collaboration between NSW government agencies, local councils, sporting organisations and not-for-profit bodies to enable facilities such as halls, libraries and sporting fields to be shared with the wider community outside of school hours. They are a form of open space provision overseen in NSW by the Department of Education, the aim being to deliver modern, purpose-built facilities and to ensure schools are at the heart of the community (DE NSW (Department of Education NSW), n.d.). Of most relevance to this research are the shared-use arrangements directly involved with greenspace provision and uses.

The NSW Department of Education – School Infrastructure NSW (SINSW) (DE NSW (Department of Education NSW), n.d.) offers three categories of shared arrangements, based on financial administration, facility type and intended shared-space usage and timings, as follows:

1. Joint use arrangements, which are an agreement between the NSW Department of Education and another party, such as a local council, to share the financial responsibilities of building and maintaining a new school asset, such as a sporting facility, that can be shared by both the relevant school and the community outside of hours.
2. Community use arrangements, between the NSW Department of Education and another organisation, such as a community sporting organisation, for access to school facilities outside of hours under certain provisions.
4. The *Share our Space* Program, a program held during NSW school holidays whereby the department permits selected NSW schools to open their outdoor school areas to individuals or establishes agreements with organisations to hold free activities. (DE NSW (Department of Education NSW), n.d.).

4.7 Summary of planning frameworks and funding mechanisms for open space provision

The chapter has provided an overview of the hierarchical set of planning instruments designed to guide the provision of open space from a state-level strategic priority perspective to a local level of implementation based on community feedback. These frameworks are designed to work together to ensure adequate open space provision is diverse, fit for purpose and connected. A brief overview of current metropolitan strategies were also provided as they relate to open space provision from a top-down perspective. A brief thematic analysis of the policy documents that further guide open space provision across Sydney was also provided along with an outline of their aims and challenges to implementation. Funding mechanisms for open space is largely dependent on developer contributions and NSW state government initiatives, whereas park maintenance is the responsibility of local councils, which comes out of local council budgets that are reported and accounted for separately.

As shown in the secondary data analysis provided in this chapter, developer contributions vary across jurisdictions, as does the successful uptake of the various NSW government-funded initiatives by local councils. Shared space arrangements were presented as an emerging solution for open space provision with various trials already underway. As noted at the top of this chapter, these concepts are important as they further validate and contextualise planners' perspectives on new open space provision. They are discussed in depth in Chapter 6.

Chapter 5: Urban density and land use for open space provision

5.1 Introduction

This research explores local authority decision-making environments facilitating the provision of a key element of liveable and healthy cities: parks. The research uses Sydney, Australia, as a case study. This chapter is the second of the three findings chapters. This chapter is divided into five sections. The first section analyses amount of land actually dedicated to open space provision in Sydney. The second section outlines the variants in park typology and function. The third section examines the drivers of local park provision including Sydney's population, and implied housing demand. The fourth section analyses common open space calculations and population ratio standards for current and future urban density and land use for open space provision. This is followed by a short summary of the open space provision findings.

The chapter narrows its focus from broader strategic and legislative planning data to the second essential form of resource allocation, in the form of land for open space provision as administered within the NSW planning system. As detailed in Section 3.3.4 "Secondary data", this chapter uses the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) to illustrate the forecast population density, housing demand, and land supply across Sydney between 2022 and 2041. It also uses relevant indicators from the Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) and applies them to a common measure of park provision (population ratio standard of 2.8 hectares (ha) per 1,000 population) as a means of identifying where and approximately when park shortfalls would occur across Sydney between 2022 and 2041. Each data set is aggregated to a local government area (LGA) level and adjusted to fit the definition of Sydney used in this research as provided in Section 1.3.2 "Definition of Sydney".

As noted in Section 2.6 “Park provision and measures”, open space standards and measurements are considered in several ways, which are relevant to this chapter as they are frequently referred to: 1) the population ratio standard is defined as a prescribed level of provision of open space related to the level of population – typically per 1000 population; 2) a land ratio standard is defined as a specified percentage of land to be reserved for open space; 3) a catchment-based standard is defined as a specification of various categories of open space, of the 'service area', or maximum distances which residents should have to travel to gain access; 4) there is consideration of the local or demand-based provision. Public open space standards and measurements are defined as specified standards of provision specific to a local area – based on local conditions, using various methodologies, and expressed in multiple ways such as population ratio, land percentage, catchment based or community led.

5.1.1 Land availability in Sydney

The complexities of population and dwelling densities across Sydney are crucial factors to consider when looking ahead toward potential land use scenarios for Sydney’s future, particularly in the context of actual land available that is fit for parks. Owing to the natural barriers surrounding Sydney on all sides, continued urban sprawl is not possible. Sydney has limited space for a growing population and the associated amenity requirements therein. The chapter further reiterates the primary data findings from this research, by quantitatively illustrating how multiple highly developed (brownfield) local government areas (LGAs) are already lacking in land available for adequate open space provision to meet current, let alone future projected population requirements and the situation is set to worsen as Sydney continues to densify.

Understanding the consequences of current and future urban density and land use for open space provision in Sydney is an important means of understanding the long-term effects of current modes of thinking and practicing open space provision. It also provides an opportunity to test planners’ perspectives regarding current practices for measuring and delivering local parks. These findings, although directly related to this case study, also provide a practical example for other jurisdictions to consider in relation to their own practices of planning for, assessing, measuring and supplying new open space provision that is adequate and fit for purpose for existing

and future city-dweller need. This is essential if cities, towns and neighbourhoods are to be, or become, healthy, liveable and sustainable.

The chapter tests assumptions from how existing open space policies and standards translate into real world terms and fit into the broader context of city-shaping scenarios. How open space is categorised across the case study area, and what that means in numerical terms when aggregated to the various geographical boundaries used in this research, highlights some of the issues faced by planners when considering how best to provide functional and appropriately sufficient parks to meet community need. The series of land use calculations provided throughout this chapter are relevant as they illustrate just how little land is allocated to open space provision and how little land is likely to be left for open space provision if Sydney remains on the same densification trajectory, and delivery mechanisms for open space do not change.

5.2 Land allocation for open space in Sydney

Greater Sydney has a substantial greenspace footprint (Y. Hsu et al., 2022). However, as Table 17 illustrates below, according to the calculations of land percentage ratios by the state government in their *Greater Sydney public open space audit* (DPE NSW & GSC, 2016), 95% of allocated land for open space is bushland, thus making it inappropriate for daily recreational use by city-dwellers. The data is divided into the Five Districts (GSC, 2018a), a map of which is provided in Figure 10 following, and the data categorises open space into three groupings: 1) passive open space such as playspaces, parks and public gardens; 2) active open space such as sports fields; 3) bushland such as national parks (DPE NSW & GSC, 2016). More recently these open space categorisations have been since recategorized by the Government Architect, *Greener Places* (GA NSW, 2020) into open space for recreation, and green infrastructure for people, thereby combining the former *Greater Sydney public open space audit* categories of passive and active open space into a single function. For the purposes of this research, the category of bushland remains (GA NSW, 2020). The evolution of the open space categorisations, especially the new open space for recreation classification, are relevant to this research, as it more closely reflects planner perspectives and considerations, and how this data is analysed immediately below. For the purposes of the discussion of the *Greater*

Sydney public open space audit (DPE NSW & GSC, 2016) data, the term ‘total open space’ will be used to denote all forms of open space as defined by *Greater Sydney public open space audit,* and the term ‘recreation’ or a derivative thereof will be used to describe parks and sports fields combined.

Table 17
Greater Sydney Open Space Audit: Open space category totals by district 2016

District	Total area (ha)	Total open space (ha)	Total population (2016)	Percentage of total area that is open space (%)	Total open space per 1000 people (ha)	Active open space (ha)	Percentage of total open space that is active open space (%)	Passive open space (ha)*	Percentage of total open space that is passive open space (%)	Bushland (ha)	Percentage of total open space that is bushland (%)
East District	21,856	3,013	1,013,200	14%	2.97	1,166	39%	1,568	52%	280	9%
North District	95,986	49,930	886,550	52%	56.32	1,175	2%	2,222	4%	46,533	93%
South District	52,364	22,076	741,250	42%	29.78	873	4%	1,924	9%	19,278	87%
West District	1,345,220	501,598	1,070,000	37%	496.97	1,844	0%	11,055	2%	488,697	97%
Central District	78,204	10,296	971,000	13%	10.6	1,447	14%	3,572	35%	5,277	51%
Total	1,593,630	586,913	4,682,000	37%	368.29	6,506	1%	20,341	4%	560,065	95%

Note: Excluding bushland, passive open space measures for each district are derived from the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016) figures for passive open space, less the amount of bushland in that district. To align the calculations with the newer (current) DPE 5 district boundaries (GSC, 2018a), amendments were made to the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016) calculations for greenspace provision (this was possible because boundary lines remain the same apart from the 2 western districts being combined to create a single larger district that now makes up the Western Parkland City). The amendments were as follows: the former Western District and Southwest District were combined to create the West District. The Western Central District was renamed the Central District. The former Central District was renamed the East District. The South District and the North District remain unchanged. Percentages of greenspace provision were calculated based on data provided in the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016). Percentages were further rounded to the nearest whole number for ease of use. Thus, they are approximations only.

When interpreting this data, it is also worth noting that there has been a substantial population increase across Greater Sydney from what was originally reported in the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016). According to the Australian Bureau of Statistics, the Greater Sydney population as of 2021 (updated) is 5,231,147 (ABS, 2021a). This may have a slight impact on how the total open space provision per 1,000 ha can be

understood, particularly in the East District. Similarly, it is assumed that open space provision variants may have slightly changed in the interim. Therefore, this data is indicative of the time from which it was published. This is not problematic however, because for the purposes of this research, this data serves a different need; that of highlighting what little amount of land percentage dedication is allotted to recreational open space across Greater Sydney.

Source: Author. Adapted from DPE NSW and GSC (2016).

Table description: Table 17 shows the categories of open space and their total allotted land percentage ratios by District for Greater Sydney in 2016. Data is adapted from the *Greater Sydney Public Open Space Audit* (DPE NSW & GSC 2016). The table has 12 columns and 7 rows, including the header row. The 1st column heading = District, the 2nd column heading = Total area (ha), the 3rd column heading = Total open space (ha), the 4th column heading = Total population (2016), the 5th column heading = Percentage of total area that is open space, the 6th column heading = Total open space per 1000 people (ha), the 7th column heading = Active open space (ha), the 8th column heading = Percentage of total open space that is active open space (%), the 9th column heading = Passive open space (ha), the 10th column heading = Percentage of total open space that is passive open space (%), the 11th column heading = Bushland (ha) and the 12th column heading = Percentage of total open space that is bushland (%). The second row heading = East District, the third row heading = North District, the fourth row heading = South District, the fifth row heading = West District, the sixth row heading = Central District and the seventh row heading = Total. The row displays totals for each column in relation to the above five rows of the East District, North District, South District, West District and Central District. A table footnote indicates that passive open space excludes bushland. The table shows that the district with most open space is the West District, which has 501,598 ha. The district with the least open space is the East District, which has 3,013 ha. The total open space for all districts combined is 586,913 ha. The district with the highest percentage of open space that is active open space is the East District, which has 39%. The district with the lowest percentage of open space that is active open space is the West District, which has 0% (when rounded down). The percentage of open space that is active open space for all districts combined is 1%. The district with the highest percentage of open space that is passive open space is the East District, which has 52%. The district with the lowest percentage of open space that is

passive open space is the West District, which has 2%. The percentage of open space that is passive open space for all districts combined is 4%.

What this data illustrates is that although Greater Sydney has an abundance of open space - 37% of total land use - that on the surface paints Greater Sydney as a “green city”. But when open space provision is categorised into its various functions, disparities emerge regarding the capacity for city-dwellers to take advantage of these spaces for daily rest and recreation. For example, only 5% of the total percentage of dedicated land for open space in Greater Sydney is allotted to community recreation. The almost exclusive percentage of land within the broader open space footprint across Greater Sydney dedicated to bushland is unsurprising, given the natural typological characteristics of the region, and to a lesser extent, various historical planning decisions that created and protect its national parks. Placing this data in a wider future focused chronological context, the land set aside for recreational use is already sparse in comparison to other land uses, and this is set to worsen as the competition for city-shaping resources increases, particularly when fit for purpose design recommendations (as discussed further in this chapter) are taken into consideration. Breaking the data down by district reveals the different inadequacies regarding land allocation for recreational open space provision across Greater Sydney. The data is discussed in the order of the above table presentation with percentages rounded down to the nearest whole number as follows.

The land-percentage ratio standard for each district was produced using the following method and rounded to the nearest whole number: Total park space percentages were acquired by calculating passive open space (ha) divided by total area (ha) multiplied by 100. Total sports field space percentages were acquired by calculating active open space (ha) divided by total area (ha) multiplied by 100. Total recreational open space percentages were acquired by adding passive open space (ha) and active open space (ha) divided by total area (ha) multiplied by 100.

1. The East District has a total land percentage dedication of open space provision of 14%, with half of that open space being dedicated to parks (52%), a further substantial land dedication to sports fields (39%) and only 9% dedicated to bushland. On the surface this translates into a significantly high proportion of the entire open space footprint for the East District dedicated to recreational open space provision. However, when recalculating the recreational open space land percentage footprint within the whole of the district (21,856 ha), significant disparities

regarding open space for recreation emerge. Approximately 7% of open space is parks, 5% is sports fields, making 13% of the entire footprint recreational open space to meet city-dweller requirements. Although comparatively high in relation to the other districts, these results (placed in the context of the East District being coastal and highly urbanised) are expected.

2. The North District has a total land percentage dedication of open space provision of 52% with only 4% of that open space being dedicated to parks, and a further 2% dedicated to sports fields and the remaining 93% of open space dedicated to bushland. This translates into a significantly low proportion of the entire open space footprint for the North District dedicated to recreational open space provision. However, when recalculating recreational open space land percentage footprint within the whole of the district (95,986 ha), significant disparities regarding open space for recreation emerge. Approximately 2% of open space is parks and 1% is sports fields, making 3% of the entire footprint recreational open space to meet city-dweller requirements. The North District is a mix of urbanised and unurbanized areas, with several minor and larger national parks located within its vicinity. Therefore, these results are somewhat in line with what is expected. However, they also reveal a potential over-burdening of recreational open space to population ratios.
3. The South District has a total land percentage dedication of open space provision of 42%, with 9% of that open space dedicated to parks, a further 4% dedicated to sports fields and the remaining 87% dedicated to bushland. On the surface this translates into a significantly low proportion of the entire open space footprint for the South District dedicated to recreational open space provision. However, when recalculating the recreational open space land percentage footprint within the whole of the district (52,364 ha), significant disparities regarding open space for recreation emerge. Approximately 4% is parks and 2% is sports fields, making 6% of the entire footprint recreational open space for city-dweller requirements. The South District is a mix of urbanised and unurbanized areas, with several major national parks located within its vicinity.

Therefore, these results are somewhat in line with what is expected and reveal a potential over-burdening of recreational open space to population ratios.

4. The West District has a total land percentage dedication of 37% with only 2% of that open space being dedicated to parks, with the land dedicated to sports fields being so small in comparison to the geographical footprint of the district that based on the data above it rounded down to 0%, and the remaining 97% is bushland. This translates into the lowest proportion of the entire open space footprint for the West District dedicated to recreational open space provision. However, when recalculating the recreational open space land percentage footprint within the whole of the district (1,345,220 ha), even more significant disparities regarding open space for recreation emerge. The West District, while having a mix of urbanisation in some areas of its footprint, is largely unurbanized in comparison to elsewhere across Greater Sydney. Much of the district is allocated to national parks, agriculture or parkland. Therefore, these results are somewhat in line with what is expected. However, they also reveal a likely over-burdening of recreational open space to population ratios.

5. The Central District has a total land percentage dedication of 13% with a third of that open space dedicated to parks (35%), a further 14% dedicated for sports fields, and the remaining half (51%) is bushland. On the surface this translates into an evenly split proportion of the entire open space footprint for the Central District dedicated to recreational open space provision. However, when recalculating the recreational open space land percentage footprint within the whole of the district (78,204 ha), significant disparities regarding open space for recreation emerge. Approximately 2% of open space is parks and 1% is sports fields, making 3% of the entire footprint of recreational open space to meet city-dweller requirements. The Central District is highly urbanised; therefore, these results are in line with the compactness of the geographical footprint (DPE NSW & GSC, 2016; GSC, 2018a; GA NSW, 2020).

Figure 10 provides a map of the five districts overlayed across the Greater Sydney boundary as a means of creating a broader perspective of the data presented.

Figure 10
Five district map

Region Boundary

District Boundary

Local Government Area

Waterways

DISTRICTS

Central City	Blacktown, Cumberland, Parramatta, The Hills
Eastern City	Bayside , Burwood, Canada Bay, City of Sydney, Inner West, Randwick, Strathfield, Waverley, Woollahra
North	Hornsby, Hunter's Hill, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Northern Beaches, Ryde, Willoughby
South	Canterbury–Bankstown, Georges River, Sutherland
Western City	Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith, Wollondilly

Source: GSC (2018b).

Figure description: Figure 10 is a map of the Greater Sydney Region. Sourced from *A Metropolis of Three Cities* (GSC 2018b). The map shows the Greater Sydney region showing Local Government Areas (LGAs) and the 5 districts – Central City, Eastern City, North District, South District and Western City. There is a key stating that the region boundary for (Greater Sydney) are red lines, the district boundaries are orange lines, LGAs are white lines and waterways are blue in colour. Each LGA is labelled, with an inset showing the smaller LGAs in and around the Eastern City. The key also lists which LGAs are in each district – the Central City has Blacktown, Cumberland, Parramatta and The Hills; the Eastern City has Bayside, Burwood, Canada Bay, City of Sydney, Inner West, Randwick, Strathfield, Waverly and Woollahra; the North District has Hornsby, Hunter's Hill, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Northern Beaches, Ryde and Willoughby; the South District has Canterbury-Bankstown, Georges River and Sutherland; and the Western City has Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly.

The East and Central District are the only two districts to have more than half of their total allotment of open space dedicated to city-dweller recreation. Whereas the North, South and West Districts are almost the reverse in terms of bushland to recreational open space proportions. As noted above, this speaks to the increased urbanisation in the East and Central districts comparative to the North, South and West Districts, along with the restricted land use zoning in those areas.

Although the East and Central Districts lead the way in overall land percentage dedicated to formal recreational open space, owing to increased population in those areas, park provision is at a higher risk of overcapacity. Therefore, the numbers are more indicative of land zone restrictions and the geographical footprint of each district than they are of actual park supply to meet city-dweller need. Conversely, the North, South and West Districts are heavily reliant on bushland to make up the bulk of their open space footprints. In relation to open space for recreation, this indicates a different set of concerns to the adequacy of park provision in those areas. These include: 1) access to infrastructure, especially in outer areas owing to the larger size of each district – this is particularly problematic in the West District, which as illustrated in Figure 10, makes up more than half of the Greater Sydney geographical

footprint; 2) increased population growth, again particularly in the West District, but also a growing concern in the North and South Districts where infill development is rapidly occurring; 3) the lack of land for formal recreation experienced across all districts, but especially in the West District, where the large proportion of bushland is compounded by the lower population density, thus leading to a potentially hidden over-burdening of park capacity for city-dweller needs. Although seemingly a lesser concern in the North and South Districts in relation to access and land percentages for recreational open space, these numbers are low and support the argument that park space is inadequate for resident needs.

5.3 Park typology and function

As explained in Section 1.4.1 “Definition of a park”, a local park is a subsidiary of urban greenspace traditionally designated for relaxation and play. Traditional twentieth-century forms of a local park are planned land uses of urban greenspace throughout the infrastructure of an urban environment, whereas non-traditional local parks (park innovations) such as rooftop parks or parklets, are adaptations of traditional concrete infrastructures overlayed with urban greenspaces that mimic the functions of a traditional local park. The analysis provided in the current chapter refers to the traditional twentieth century form of a local park. When considering the spatial configuration of local parks, the number of local parks and their spatial distribution across local government areas from a geographical perspective represents the potential park access for local residents. These ideas are discussed in further detail below.

Table 18 outlines park typology benchmarks as recommended by the Government Architect in their *Greener Places* (GA NSW, 2020) relevant to policy and planning considerations, urban development and site design. The data is designed to support scalable equitable open space provision and create more integrated outcomes for park provision. The *Greener Places* (GA NSW, 2020) links in with strategic considerations across state government entities and local councils such as the *Public open space strategy for NSW* (DPE NSW, 2022), the *Sydney Green Grid* (DPHI NSW, 2024s) and the *Strategic Planning Toolkit* (DPHI NSW, 2024r).

Table 18
Government Architect NSW Park classifications based on size and distance from housing

Park classification	Size	Distance from dwelling
District sports precincts	Minimum 10 hectares	N/A
Regional open space	5 and above hectares	30 minutes on public transport or driving from housing
District open space	2-5 hectares	2km or twenty-five-minute walk from housing
Local open space	0.5-2 hectares; desirable minimum size of a local park is 0.3ha or 3000m^2	Between 200m and 400m or two – five minutes' walk from housing
High-density area local open space	Parks may be as small as 0.15ha 1500m^2 where more efficient provision does not exist or opportunities for re-use of small spaces arise	Up to 200m from housing

Note: Regional and district parks may also serve as local access. Demand from non-resident population is estimated as 10% of the anticipated resident population.

Source: Author. Adapted from GA NSW (2020).

Table description: Table 18 lists basic park classifications in NSW, ordered by park size from largest to smallest. Data is adapted from *Greener Places* (GA NSW, 2020). The table has 3 columns and 6 rows, including the header row. The 1st column heading = Park classification, the 2nd column heading = Size and the 3rd column heading = Distance from dwelling. A district sports precinct is 10 hectares or above. However, the largest park classification is 'Regional open spaces', which are 5 and above hectares. Regional open spaces are between 5-10km from a dwelling. The smallest sized park classification is 'High-density area local open spaces', which can be as small as 0.15 ha. High-density area local open spaces are up to 200m from a dwelling.

When considering how these measurements apply to Sydney, as noted in Section 2.6 "Park provision standards and measures", the literature is mixed on their effectiveness (Veal, 2013, 2020; Veal & Piracha, 2022). The state government partnership in their *Greater Sydney public open space audit* (DPE NSW & GSC,

2016) estimated that across Metropolitan Sydney, 97.5% of dwellings were within 400m of open space bigger than 3000m^2 and projected that the percentage of high-density dwellings within 200m of open space bigger than 1500m^2 would be 81.8% by 2021 (GA NSW, 2018). However, there has since been little evidence provided by the state government as to whether these goals were realised. This is hardly surprising given that policy has since moved toward a more equitable and demand-based focus for open space provision (DPHI NSW, 2024e; GA NSW, 2020; NSW Government, n.d.-a) as discussed in Section 4.4 “Policy frameworks”. However, this is not to say that access catchment-based standards and population ratio standards are not still heavily relied upon to perform the necessary checks and balances required in a market-driven planning landscape (further discussed in Chapter 7). As to the different park types, design considerations and functions, these are further defined below as a means of explaining how they need to fit into an existing or future densified landscape.

5.3.1 The functions of different park types

Different park types serve different functions for city-dwellers and thus are distributed differently throughout the broader open space network as noted above. These are a local park, district park, district sports precinct and regional park. Not only are they differentiated by size or population or area capacity, but in how they are accounted for and designed (GA NSW, 2020). These are important considerations when placed in the broader context of city-shaping priorities, particularly when measured against future population and dwelling demand, as they illustrate that in order for parks to be functional, they cannot be squashed into ‘spare’ space without various accountability measures in place, which when considering the lack of land percentage allocated across Sydney for park provision, presents quite a challenge for planners moving forward. Sports precincts were noted above as they emerge as a secondary theme in relation to planner perspectives in Chapter 6. Linear parks are noted below as they also present as an increasingly relevant park innovation consideration for planners in a rapidly densifying environment. Passive and active open spaces are generally deemed to be at capacity through a combination of catchment based and population ratio measurements.

A local park, the smaller of these also known as a pocket park, provides small-scale accessible open spaces for informal recreation, play (often with play

equipment), community interaction and relaxation within walking distance of local residence. Local park frontages have a minimum design standard of 50% of perimeter to public roads. Characteristics can include a combination of the following: shaded seating and play areas, accessible pathways, tree canopy for thermal comfort, open grassed areas and gardens, lighting and safety sightlines. Local parks are deemed to be at capacity if more than 1500 residents to 5000 m^2 of parkland are within 500m.

A linear park provides opportunity for rest and recreation and are active green linkages between public space. They are often considered supplemental to existing open space. They have a minimum design standard of 25% road frontage with no section of road less than 50m and multiple access points, and minimum of 50% tree canopy covering over activity distance. Linear parks need to be adequately buffered from incompatible uses such as constructed drains and overland flow paths. If near a creek, it must be minimum 20m from the top of the bank and not steeply sloping. If the access point is minor, 5m wide is permissible. Characteristics may include the following: minimum running, walking or cycling paths between 1km and 2.5km context dependant, but can exceed these limits if unbroken by road linkages or other barriers. Other amenity may include seating, look out points, and exercise equipment.

A district park is larger than a local park and serves a greater variety of recreation options. They support both structured and unstructured recreation, frequently having capacity for sports, events, and community gatherings. District parks have a minimum design standard frontage 50% of perimeter to public roads and multiple public access points with at least one vehicle entry. Characteristics may include a combination of the following: multi-purpose sports fields or courts, shared paths and internal loop trails, amenities blocks, picnic shelters, BBQ facilities and car parking. District parks are deemed to be at capacity at 5000 people per 0.5 ha within 5 km.

Sports precincts are frequently provided on a district level. They are larger than a district park and they provide opportunities for structured active recreation. Comparative to passive open space, there are different delivery challenges in relation to size, shape, slope, soil and drainage, amenity positioning, flood risk and restructures that are essential if active open space is to be fit for purpose. However,

sports fields and other forms of active open space do not have to be provided as part of a sports precinct – they are encouraged to be provided as smaller stand-alone amenity where land availability permitting (minimum 1 ha for formal recreation with a minimum of 150m width for optimal use). Informal recreation space has a recommended minimum of 40m wide and 60m deep for informal kick around spaces. Furthermore, it is worth noting that rooftop structures and school grounds are permissible. Sports precincts have a minimum design standard of minimum road frontage of 50% as does most open space. Characteristics may include a combination of the following: changeroom facilities, club houses, onsite parking, access networks and buffers between adjacent uses, a mix of formal courts and pitches for multi-sport play. Outdoor sporting land is deemed to be at capacity when it exceeds a population ratio of 1000 people/ha. However, caution is given to peak time and demand rather than theoretical hours of use (this type of active open space differs from adventure sports facilities such as bouldering parks, BMX tracks and walking trails often found as part of linear parks). Walking trails are deemed to be at capacity at 1000 people per km within 800m.

A regional park is larger than a district park, designed to serve larger populations, and has greater amenity for city-dweller use and ecological preservation. Regional parks have a minimum design standard of multiple major access points, gateway entries and signage. Characteristics may include a combination of the following: recreational trails (walking/cycling), picnic areas, playgrounds, water features, habitat corridors and nature play, interpretive signage, cultural heritage elements, café or kiosk facilities (where appropriate), and public art or event spaces (GA NSW, 2020).

5.4 Drivers of local park provision

By 2041, the population of Sydney is forecast to reach 5,273,348 people, an increase of 1,613,002 people compared with 2022 (DPIE NSW, 2020). Sydney has a significant amount of greenspace within its footprint (Y. Hsue et al., 2022) and as noted in Section 4.6 “State government grants”, Sydney is attempting to cultivate a growing network of parklands, other urban parks, sports fields, community gardens, green roofs, rain gardens, living walls, urban forests and street trees greening the city, in a bid to ensure public spaces are welcoming, accessible, vibrant, resilient and

sustainable places to be. As stated previously, these nature-based implemented outcomes are a vital part of the complex organism of the city that bring seen and unseen benefits into the heart of the places where people work and live. As Sydney's population grows and neighbourhoods experience higher brownfield or greenfield development, including urban greening, parks where people can freely congregate, rest and enjoy recreational pursuits will become increasingly important but challenging to implement when situated against the backdrop of urban growth. Table 19 charts the projected population growth based on population density, implied housing demand and population growth as a total percentage across Sydney between 2022 and 2041, using data from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020). LGAs are listed in alphabetical order and assigned to the relevant primary district in which they are located.

Table 19
Drivers of local park provision in Metropolitan Sydney 2021-2041, by LGA in alphabetical order

District	LGA	2022 Population density (people/ha)	2041 Projected population density (people/ha)	2022 Implied housing demand (dwellings)	2041 Implied housing demand (dwellings)	2022-2041 Percentage population growth	2022-2041 Percentage population increase (%)
Eastern City	Bayside	34.1	38.6	70820	83629	13.3	12
Central City	Blacktown	17.2	20.5	129932	180693	29.0	17
Eastern City	Burwood	57.2	81.9	15950	23319	39.9	82
Western City	Camden	6.3	9.8	37185	74688	81.8	13
Western City	Campbelltown	5.8	7.4	63146	86424	30.8	25
Eastern City	Canada Bay	44.7	54.4	41624	48616	11.7	48
South	Canterbury-Bankstown	33.7	40.5	136065	169145	16.9	4
Central City	Cumberland	32.6	42.5	83891	110030	25.2	54
Western City	Fairfield	20.3	24.4	68642	85979	17.4	8
South	Georges River	39.9	46.0	59839	72533	15.8	10
Central City	Hills	5.1	7.4	61986	100783	54.4	29
Central City	Parramatta	31.0	46.6	100835	154943	7.5	40
Eastern City	Inner West	51.9	60.0	90586	100723	4.3	10
Eastern City	Randwick	37.4	46.9	65949	76141	7.0	11
Eastern City	Strathfield	32.9	40.2	17986	22171	10.5	7

District	LGA	2022 Population density (people/ha)	2041 Projected population density (people/ha)	2022 Implied housing demand (dwellings)	2041 Implied housing demand (dwellings)	2022-2041 Percentage population growth	2022-2041 Percentage population increase (%)
Eastern City	Sydney	81.6	111.0	123394	162059	16.3	16
Eastern City	Waverley	74.0	80.9	34270	37839	33.9	6
Eastern City	Woollahra	43.6	50.4	29183	31875	1.4	11
North	Hornsby	3.3	3.6	56172	64707	11.6	35
North	Hunters Hill	23.5	27.3	5700	6114	5.7	6
North	Ku-ring-gai	14.5	16.5	46634	54692	48.4	6
North	Lane Cove	38.2	45.3	17470	20991	25.2	16
North	Mosman	32.5	35.9	14697	16278	10.8	27
North	North Sydney	66.0	80.0	41345	47932	35.2	25
North	Northern Beaches	10.3	11.4	114183	130106	16.9	17
North	Ryde	32.3	44.5	54028	75809	10.5	12
North	Willoughby	33.6	39.8	33604	39892	27.5	34
South	Sutherland	6.9	7.7	93442	110662	5.9	1
Western City	Liverpool	7.8	10.2	77606	109959	10.5	31
Western City	Penrith	5.4	6.7	80870	106946	6.1	17

Source: Author. Adapted from DPIE NSW (2020).

Table description: Table 19 shows population density/projected population density and implied housing demand for 2022 and 2041, by LGA. Data is from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020). The table has 8 columns and 31 rows, including the header row. The 1st column heading = District, the 2nd column heading = LGA, the 3rd column heading = 2022 Population density (people/ha), the 4th column heading = 2041 Projected population density (people/ha), the 5th column heading = 2022 Implied housing demand (dwellings), the 6th column heading = 2041 Implied housing demand (dwellings), the 7th column heading = 2022-2041 Percentage population growth, and the 8th column heading = 2022-2041 Percentage population increase (%). The table indicates that both population density and implied dwelling demand are projected to increase between 2022 and 2041 for all LGAs in Metropolitan Sydney, though this increase is not uniform across LGAs.

5.4.1 Sydney's population

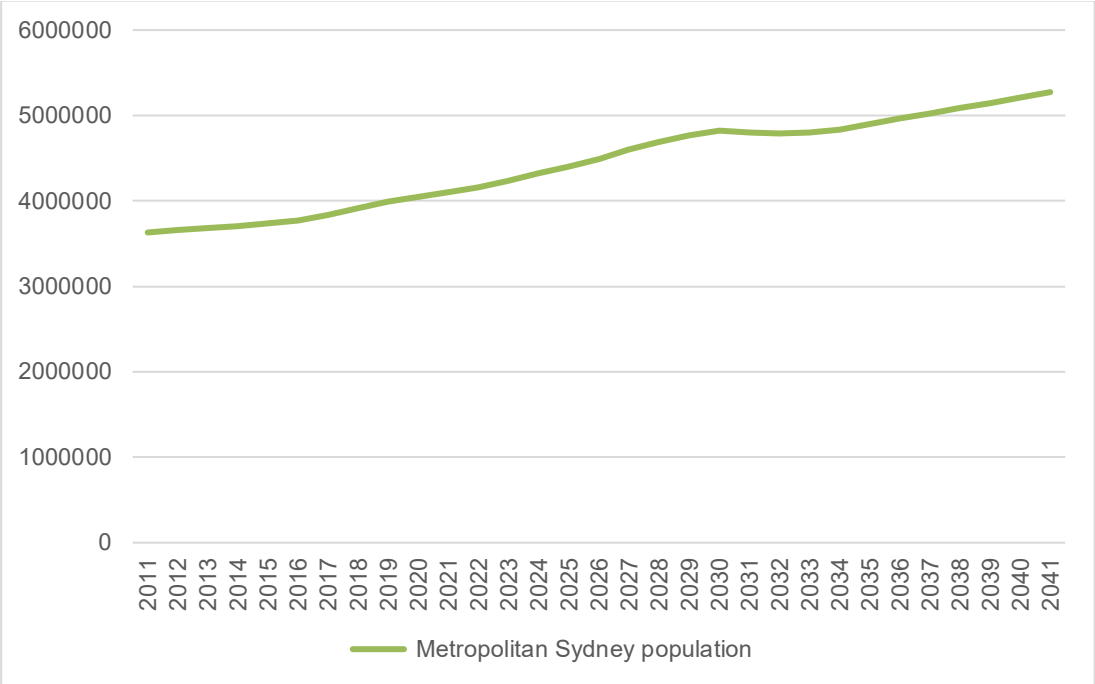
In 2021, the population of the Sydney metropolitan area was 4,830,047 people (ABS, 2021b)[31]. Greater Sydney has the highest population density per square kilometre in Australia of 480 people per square kilometre (NSW Environmental Protection Authority [NSW EPA], 2021). Using the Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b) for population density calculations aggregated to an LGA level across Sydney, the three most densely populated LGAs in order of population density for 2021-2022 calculated to hectares from kilometres squared and rounded down to the nearest whole number were as follows: 1) City of Sydney at 626 people/ha; 2) Waverley at 74 people/ha; 3) North Sydney at 66 people/ha. The disparity of population densities between City of Sydney and Waverley LGAs is explained by the City of Sydney being the predominant CBD in Sydney, whereas Waverley is considered residential in nature, while North Sydney is part secondary CBD and part residential.

The three lowest LGAs in order of population density for 2021-2022 using the same data and calculations as above but rounded to one decimal point for clarity, from most dense to least were as follows: 1) Campbelltown at 5.7 people/ha; 2) Penrith at 5.4 people/ha; 3) The Hills at 5.1 people/ha. These are all LGAs on the outer skirts of Sydney, therefore these findings are to be expected given they are all located in greenfield areas.

When considering the current medium growth scenario of population projections for Sydney, based on an LGA level between 2022 and 2041, as indicated in Figure 11 there is a variation in expected population increases across Sydney based on area. Population projections are an important consideration in decision-making processes for current and future local park provision. Local parks are generational infrastructure. This is to say, they have an anticipated service life spanning hopefully half a century or more, and the decisions about their placement, size, and to a lesser degree, their attributes, or intended use, will become their own legacy infrastructure amenity of the future. There is already more pressure in some LGAs in Sydney regarding park provision in relation to current open space standards and practice, in terms of both access and a per capita rate of 2.8 ha per 1,000 population. An increase in population over the coming decades is going to exacerbate many of the

challenges faced by local councils regarding how to best provide open space for local residents.

Figure 11
Annual Sydney population projections from 2011 to 2041



Source: Author. Adapted from DPIE NSW (2020).

Figure description: Figure 11 shows a line graph of annual Metropolitan Sydney population projections for 2011 to 2041. Data is adapted from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020). The x-axis plots the year, from 2011 to 2041. The y-axis plots projected population, from 0 to 6,000,000. A key at the bottom of the graph indicates that a green line plots the projected Metropolitan Sydney population for each year. The graph shows that Metropolitan Sydney's population is projected to increase from roughly 3.6 million people in 2011 to roughly 5.3 million people in 2041. The graph shows an increase in projected population for each included year. The rate of increase remains steady over the 30-year period, with the exception of a slower period of increase between 2011 and 2016 and a period of relatively small population increase between 2030 and 2033.

The projected percentage increase of actual population in Metropolitan Sydney aggregated to an LGA level from 2022 to 2041 using the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) shows that the top 10 LGAs with the largest percentage increase of actual population (in descending order) is as follows: 1) Burwood is predicted to increase by 82%; 2) Cumberland by 54%; 3) Canada Bay by 48%; 4) Parramatta by 40%; 5) Hornsby by

35%; 6) Willoughby by 34%; 7) Liverpool by 31%; 8) The Hills by 29%, 9) Mosman by 27%; 10) Campbelltown by 25%. When examining the population forecast data from a broader spatial perspective, population growth is somewhat patchy across Metropolitan Sydney. This is not only evidenced through the ranking of the top 10 local councils listed above, but continues through the mid-range population forecasting data, that is, local councils whose populations are forecast to increase between 20% and 29%. LGAs with a 10%-19% forecast increase in population are mostly in the west and east of Metropolitan Sydney.

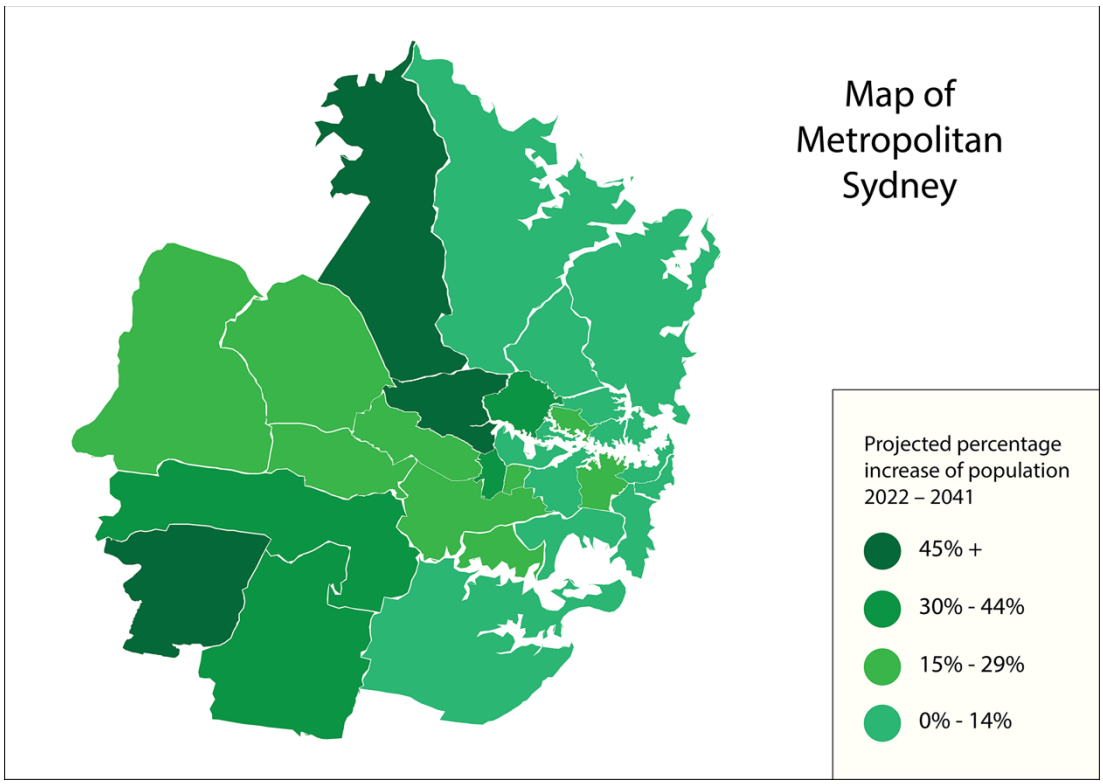
The 10 LGAs with the smallest predicted percentage increase in actual population in Metropolitan Sydney from 2022-2041 using data from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020), ranked in ascending order and grouped together where the percentage increase is the same are as follows: 1) Sutherland, which is expected to increase by 1%; 2) Canterbury-Bankstown by 4%; 3-5) Ku-ring-gai, Waverley and Hunters Hill by 6%; 6) Strathfield by 7%; 7) Fairfield by 8%; 8 & 9) Georges River and the Inner West by 10%; 10) Woollahra by 11%. From a broader spatial perspective, when considering the data in relation to wider Metropolitan Sydney, LGAs with the smallest predicted percentage increase in actual population, that is, LGAs with a projected 0%-9% increase, are mostly in the south of Metropolitan Sydney.

Examining the data through a spatial lens, the LGAs with the largest percentage increase in population density are in the north and west of Metropolitan Sydney. LGAs with a 30%+ increase in actual population density and LGAs with a 20%-29% increase in population density are frequently located in the north-west areas. Examining the mid-range data, LGAs with a 10%-19% increase in actual population density are mostly in the west and east of Metropolitan Sydney.

It is anticipated that given these population predictions, the likelihood of open space provision being adequate in many areas is extremely low. Particularly in brownfield areas where land availability is lacking for conversion to open space. However, while there is more available land in greenfield areas that can potentially be allocated for park provision, given the low priority afforded to open space provision in comparison to other priorities, adequate open space provision to meet city-dweller requirements is questionable.

Figure 12 provides a snapshot of anticipated population increases aggregated to an LGA level. Data indicates that population growth does not take place at the same even rate across the region. This is to be expected given the state government push for growth in the outer areas of Sydney (GSC, 2018b). However, the data also indicates that brownfield LGAs, particularly in the middle suburban rings of Sydney toward the west, are going to be under increasing pressure to provide public amenity to meet increasing city-dweller requirements, as their population growth estimates are also quite high. Whereas LGAs with a higher degree of bushland (that assumably cannot be developed) are likely to experience less population growth, or where it does occur it is more spread out, thereby the pressures on the provision of public amenity including open space provision are at least in theory, likely to be lessened in comparison. However as noted above, hidden pressures on open space provision are an increasing challenge for LGAs, that are not always recognised through spatial data analysis.

Figure 12
Percentage population growth 2022-2041 by LGA



Source: Author. Adapted from DPIE NSW (2020).

Figure description: Figure 12 shows a map of Metropolitan Sydney. Data is adapted from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020). The map is overlaid using 1 administrative boundary type, LGA boundaries, which are white. The LGAs are coloured 1 of 4 shades of green. A key, titled Projected percentage increase of population 2022-2041, shows that LGAs with a percentage population increase of 45%+ = very dark green, LGAs with a percentage population increase of 30% to 44% = dark green, LGAs with a percentage population increase of 15% to 29% = medium green and LGAs with a percentage population increase of 0% to 14% = light green. The maps indicate that 3 LGAs are projected to experience percentage population increases of 45%+, located in the north and south-west of Metropolitan Sydney. Four LGAs are projected to experience percentage population increases of 30% to 44%, located in the north, south-west and inner west of Metropolitan Sydney. Nine LGAs are projected to experience percentage population increases of 15% to 29%, located in the west, inner-west and CBD of Metropolitan Sydney. Nine LGAs are projected to experience percentage

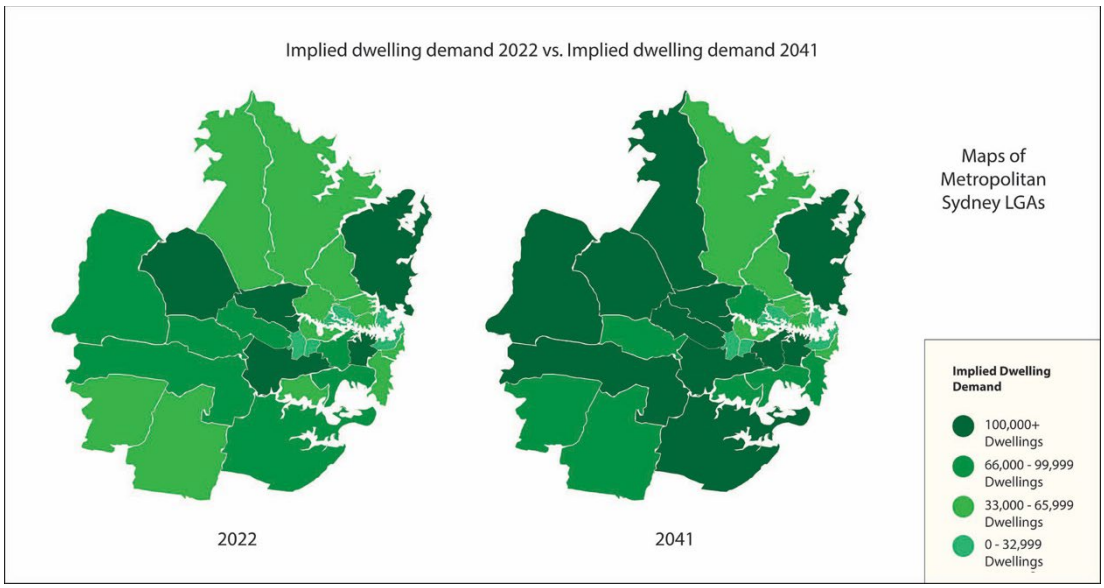
> population increases of 15% to 29%, located in the west, inner west and CBD of Metropolitan Sydney. Fourteen LGAs are projected to experience percentage population increases of 0% to 14%, located in the north, east and south of Metropolitan Sydney.

5.4.2 Sydney's implied housing demand

The projected percentage increase of implied housing demand in Metropolitan Sydney, aggregated to an LGA level from 2022-2041 based on the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) shows that the LGAs with the largest percentage increase in housing density are in the northwest and southwest of Metropolitan Sydney. LGAs with a 30%-44% increase in housing density are mostly in the west of Metropolitan Sydney. Ryde and Sydney are the only LGAs with a 30%-40% increase in housing density in the east of Metropolitan Sydney. LGAs with a 15%-29% increase in housing density are mostly in the east of Metropolitan Sydney. Fairfield is the only LGA with a 15%-29% increase in housing density in the west of Metropolitan Sydney. LGAs with a 0%-14% increase in housing density are in the east and northeast of Metropolitan Sydney.

The data indicates that the outer suburban ring areas earmarked for higher density housing, are likely to experience unprecedented pressure for public amenity provision including open space, unlike that experienced previously. While areas in the inner and middle suburban rings of Sydney, particularly to the east and north are not set to increase in housing density quite as substantially, they too are already under increasing pressure to provide adequate public amenity. Therefore, areas in the outer northwest and southwest of Sydney could learn from the problems faced by already densified areas in Sydney regarding open space provision and make the most of their greenfield status and plan accordingly. This is to say, go beyond traditional means of open space practice and measurement, assume that growth is likely to be higher – based on the inaccuracy of previous predictions, and place open space provision and innovation at the front and centre of planning agendas and implementation while they still have a relatively high supply of land to do so. The predicted dwelling demand pressures are shown below in Figure 13.

Figure 13
Comparison of implied housing demand in 2022 and 2041, by LGA



Source: Author. Adapted from DPIE NSW (2020).

Figure description: Figure 13 shows a comparison of 2 maps of Metropolitan Sydney. Data is adapted from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020). The map on the left is labelled 2022 and the map on the right is labelled 2041. The maps are overlaid using one administrative boundary type, LGA boundaries, which are white. In both maps, LGAs are coloured 1 of 4 shades of green. A key, titled Implied housing demand, shows that LGAs with 100,000+ dwellings = very dark green, LGAs with 66,000 to 99,999 dwellings = dark green, LGAs with 33,000 to 65,999 dwellings = medium green and LGAs with 0 to 32,999 dwellings = light green. The maps show that between 2022 and 2041, there is a projected increase from 5 to 7 LGAs with 100,000+ dwellings, a projected decrease from 8 to 7 LGAs with 66,000 to 99,999 dwellings, a projected decrease from 12 to 6 LGAs with 33,000 to 65,999 dwellings and 6 LGAs with 33,000 to 65,999 dwellings in both 2022 and 2041. The maps indicate that in 2022 there were 5 LGAs with 100,000+ dwellings, located in the west, inner west, northeast and CBD of Metropolitan Sydney. In 2041 there are projected to be 7 LGAs with 100,000+ dwellings, located in the west, northwest, inner west, northeast and southeast of Metropolitan Sydney. In 2022 there were 8 LGAs with 66,000 to 99,999 dwellings, located in the west, inner west and southeast of Metropolitan Sydney. In 2041 there are projected to be 7 LGAs with 66,000 to 99,999 dwellings,

located in the west, southwest, inner west and east of Metropolitan Sydney. In 2022 there were 12 LGAs with 33,000 to 65,999 dwellings, located in the southwest, inner west, north and east of Metropolitan Sydney. In 2041 there are projected to be 6 LGAs with 33,000 to 65,999 dwellings, located in the north and east of Metropolitan Sydney. In 2022 there were 6 LGAs with 0 to 32,999 dwellings, located in the inner west, north and east of Metropolitan Sydney. In 2041 there are projected to be 6 LGAs with 0 to 32,999 dwellings, located in the inner west, north and east of Metropolitan Sydney. The figure shows that the LGAs with the largest increase in housing density are in the northwest and southwest of Metropolitan Sydney. LGAs with mid-range increase in housing density are mostly in the west of Metropolitan Sydney. Ryde and Sydney are the only LGAs with a mid-range increase in housing density in the east of Metropolitan Sydney. LGAs with a lower-medium range increase in housing density are mostly in the east of Metropolitan Sydney. Fairfield is the only LGA with a lower-medium increase in housing density in the west of Metropolitan Sydney. LGAs with a low range increase in housing density are in the east and northeast of Metropolitan Sydney.

5.5 Common open space calculations

As noted above, the four most popular means of open space calculations used to standardise open space provision across the urban environment are: 1) the access catchment-based standard; 2) the population ratio standard; 3) the land ratio standard; 4) demand-based planning (Y. Hsu et al., 2022). NSW uses a combination of access standards (GA NSW, 2020), population ratio standards (OLG NSW, 2024b) and increasingly is moving toward a demand-based planning model for open space provision (DPHI NSW, 2024e; GA NSW, 2020; NSW Government, n.d.-a). However, catchment-based standards and population ratio standards are still considered useful, particularly in relation to high dwelling density areas and capacity measures for park provision (GA NSW, 2020).

The following data provides an example of increased urbanisation and decreasing open space provision across Sydney based on a typical population ratio standard of 2.8 ha per 1,000 population and applied to the Office of Local Government ‘council area’ converted from km^2 to hectares (ha) from the *Time series*

data 2020-2021 (OLG NSW, 2024b) along with population growth projections as administered by the former NSW Department of Planning and Environment from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) for 2022, 2026, 2031, 2036 and 2041[32]. The intent of providing the data is to illustrate high level policy implications of using a population ratio standard as a reporting mechanism. It is worth noting that Veal (2020) concedes that it is unlikely such measures are implemented so strictly in practice.

The population-ratio standard for each LGA was produced using the following method:

1. LGA density (persons per ha) was calculated by dividing the DPIE population projection for each LGA by the OLG council area (ha).
2. Total council area (ha) per 1,000 persons was calculated by dividing 1,000 by LGA density.
3. The population-ratio standard was then applied by multiplying council area per 1,000 persons by 2,800 (2.8 ha x 100 ÷ total residential land for 1,000 persons) to arrive at a final figure for the implied open space required per LGA, expressed as a percentage of council area.

Each of these equations were calculated for 2022, 2026, 2031, 2036 and 2041.

The data is provided as a proxy value snapshot for future open space provision across Sydney aggregated to an LGA level. As data is aggregated to an LGA level, it does not reflect pockets of density or sprawl or any other characteristic or point of difference that occurs within and between LGAs such as greyfield infrastructure precincts, national parks or other factors that naturally inhibit the percentage of residential area and open space provision.

5.5.1 Population ratio standard

Based on data from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) and the public open space indicator from the *Time series data 2020-2021* from the Office of Local Government (OLG NSW, 2024b), Table 20 illustrates that, based on applying a set population ratio standard of 2.8 ha per 1,000 population across each LGA, 60% of LGAs will have sufficient open space from 2022 through 2041, 30% of LGAs will have insufficient open space for the entire duration and 10% of LGAs will run out of sufficient open space at some point

during this period. This translates to a total of 40% of local councils across Sydney not having enough open space to accommodate local residents in 2041 based on current calculations aggregated to an LGA level. This does not take into consideration existing pockets of high-density dwellings within jurisdictions. Local councils that already have insufficient land for park provision (30%) based on these calculations are as follows (in alphabetical order): Burwood, Canada Bay, Cumberland, Inner West, Lane Cove, North Sydney, Sydney, Waverley and Woollahra. The 30% of local councils that have already run out of land for park provision based on these calculations are predominantly from inner-ring areas. Local councils that are likely to run out of land at some point in the coming decades (10%) based on these population ratio standard scenarios are as follows (in chronological order): Georges River, Parramatta and Camden. Of these three local councils that are assumed to run out of land for park provision, two are from middle-ring areas with increasing densities and the third is an outer-ring, greenfield, low-sprawl LGA. The remaining 18 local councils (60%) are expected to have sufficient open space for park provision until at least 2041 if current growth forecast estimates are accurate and current open space standards remain in place and are continually considered adequate. These local councils are predominantly from middle-ring and outer-ring areas and a mix of brownfield and greenfield areas.

Table 20
Population ratio standard open space implications of actual 2022 population and projected populations for 2022, 2026, 2031, 2036 and 2041, by LGA in alphabetical order

LGA	Open space to council area requirement (%)	Projected open space to council area requirement (%)				
		2022	2026	2031	2036	2041
Bayside	12.6*	9.5	9.6	10.3	10.6	10.8
Blacktown	14.2	4.5	4.7	5.0	5.4	5.7
Burwood	5.6	16.4	18.0	20.1	22.2	22.9
Camden	2.3	1.5	1.7	2.0	2.3	2.8
Campbelltown	3.5	1.6	1.6	1.8	1.9	2.1
Canada Bay	6.5	13.6	14.1	14.5	14.9	15.2
Canterbury-Bankstown	12.1	9.7	10.0	10.4	10.9	11.3
Cumberland	9.4	9.5	10.0	10.8	11.4	11.9
Fairfield	8.3	5.8	5.9	6.1	6.4	6.8
Georges River	11.2	11.1	11.2	11.7	12.3	12.9
Hornsby	2.9	0.9	0.9	1.0	1.0	1.0
Hunters Hill	17.5	7.3	7.4	7.4	7.5	7.6
Inner West	0.1	15.7	15.7	16.0	16.4	16.8
Ku-ring-gai	18.9	4.2	4.3	4.4	4.6	4.6
Lane Cove	5.0*	10.9	11.8	12.2	12.6	12.7
Liverpool	4.4	2.1	2.3	2.5	2.7	2.9
Mosman	20.7	9.9	9.9	10.0	10.0	10.0
North Sydney	12.4	20.1	20.6	21.4	22.2	22.4
Northern Beaches	9.4	3.0	3.0	3.1	3.1	3.2
Parramatta	10.4	8.8	9.3	10.2	11.5	13.0
Penrith	2.5	1.5	1.5	1.6	1.8	1.9
Randwick	20.1	11.8	11.9	12.2	12.6	13.1
Ryde	18.8	9.2	9.7	10.8	11.5	12.5
Strathfield	11.7*	9.6	10.4	10.8	11.0	11.3
Sutherland	8.1	2.0	2.0	2.1	2.1	2.2

LGA	Open space to council area requirement (%)	Projected open space to council area requirement (%)				
		2022	2026	2031	2036	2041
Sydney	8.6	24.4	24.8	26.8	29.0	31.1
The Hills	3.1	1.3	1.5	1.7	1.9	2.1
Waverley	11.7	21.4	21.4	21.7	22.1	22.6
Willoughby	16.1	10.1	10.3	10.7	10.9	11.2
Woollahra	11.4	13.3	13.3	13.5	13.7	14.1

Note: Bayside, Lane Cove and Strathfield open space data is from 2019; more recent data was not available. This is indicated by an Asterix within the table.

Source: Author. Adapted from DPIE NSW (2020) and the (OLG NSW, 2024b).

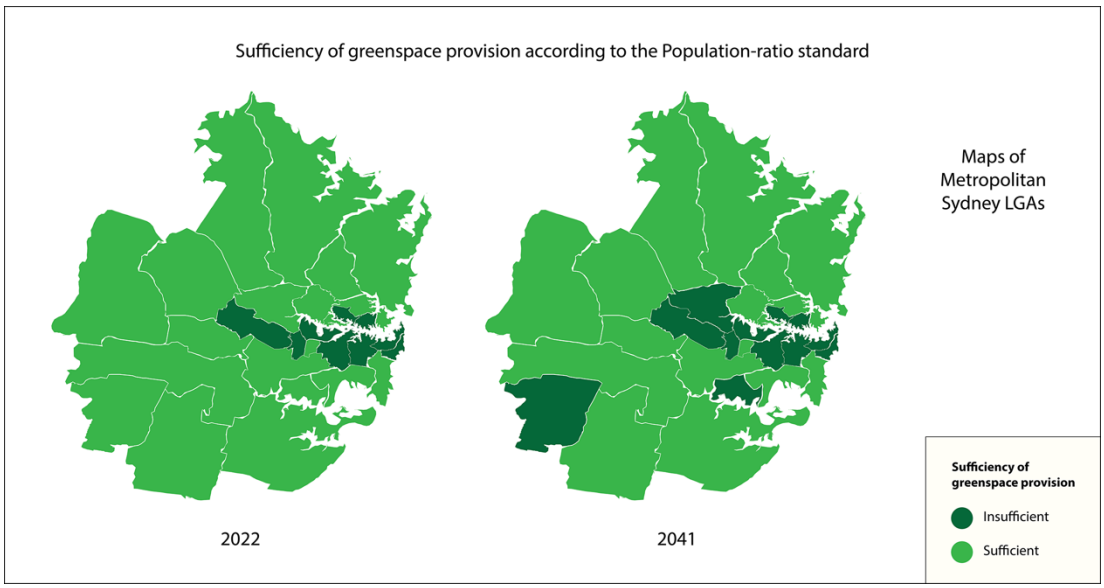
Table description: Table 20 shows population ratio standard open space implications for 2022 population and projected populations for 2022, 2026, 2031, 2036 and 2041, by LGA, ordered alphabetically. Data is adapted from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) and *Time series data 2020-2021* (OLG NSW, 2024b). The table has 7 columns and 31 rows, including the header row. The 1st column heading = LGA, the 2nd column heading = Open space to council area requirement (%), the 3rd column heading = Projected open space to council area requirement (%) 2022, the 4th column heading = Projected open space to council area requirement (%) 2026, the 5th column heading = Projected open space to council area requirement (%) 2031, the 6th column heading = Projected open space to council area requirement (%) 2036 and the 7th column heading = Projected open space to council area requirement (%) 2041. A key indicates that table cells shaded light green = Sufficient open space and table cells shaded dark green = Insufficient open space. Each table cell in the 3rd through 7th columns is shaded either dark green or light green based on population ratio standards projections. The table indicates that 60% of LGAs will have sufficient open space from 2022 through 2041, 30% of LGAs will have insufficient open space for the entire duration and a further 10% of LGAs will run out of sufficient open space at some point during this period.

Table 20 shows when applying a set calculation of 2.8 ha per 1,000 population to the total land area of each local council in a bid to establish the actual versus

desirable measure of land area percentage required to service a jurisdiction based on population projections, the following trends emerge. Some local councils have capacity to provide enough traditional open space and will in theory, continue to have ample land at their disposal to service new populations into the medium term. But other local councils are already lacking in land area to meet current population pressure. For example, based on the actual 2022 population of Waverley LGA, if the standard of 2.8 ha per 1,000 population were applied, Waverley would require 21% of council area to be open space to service the population. Whereas based on the total land area of the LGA there is only capacity for 11% of the land area to be dedicated to open space provision if the calculation of 2.8 ha per 1,000 population were to be strictly applied. Waverly LGA is located in the inner/middle ring area of Sydney and is highly residential with a mix of low, medium and high housing density. In contrast, if the standard of 2.8 ha per 1,000 population were applied to Hornsby LGA in that same period, only 0.9% of the total council area is required for open space based on the population. The data shows that Hornsby LGA is likely to remain below the threshold of desirable land percentage area based on the population for the foreseeable future. Hornsby LGA is located on the outer ring of Sydney and although not considered a greenfield area, in that it is a well-established LGA comparative to those in Western Sydney, it does have a large percentage of land area dedicated to bushland and farmland.

Figure 14 shows how many local councils are currently without enough open space to meet population ratio standards, based on applying a set population ratio standard of 2.8 ha per 1,000 population to the actual 2022 population data within each local council, and how many local councils will be without enough open space in 2041, based on population projections. These figures are based on data provided in Table 20. The figure shows that currently there is inadequate open space provision in 9 LGAs, mainly situated in the inner suburban ring of Sydney. The figure also shows that in 2041 there will be an increase in the number of local LGAs without adequate open space provision, extending into middle ring suburban areas and one outlier on the peri-urban fringe of Sydney.

Figure 14
Population ratio standard open space land sufficiency 2022 and 2041, based on 2022 population and projected 2041 population, by LGA



Source: Author. Adapted from DPIE NSW (2020) and OLG NSW (2024b).

Figure description: Figure 14 shows a comparison of 2 maps of Metropolitan Sydney. Data is adapted from the *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) and the *Time series data 2020-2021* (OLG NSW, 2024b). The map on the left is labelled 2022 and the map on the right is labelled 2041. The maps are overlaid using one administrative boundary type, LGA boundaries, which are white. In both maps, the LGAs are coloured one of 2 shades of green. A key, titled Sufficiency of greenspace provision, shows that LGAs with Insufficient greenspace provision = very dark green and LGAs with Sufficient greenspace provision = medium green. The maps indicate that in 2022 there were 9 LGAs with insufficient greenspace provision, located in the inner west, CBD and east of Metropolitan Sydney. In 2041 there are projected to be 12 LGAs with insufficient greenspace provision, located in the inner west, southwest, CBD, south and east of Metropolitan Sydney.

5.6 Summary of open space provision findings

The chapter has provided a series of snapshots based on various scenarios of open space provision across Sydney aggregated firstly to a district level and then aggregated to an LGA level. As noted above, district levels are seen as important by

state government as they are a bridge between metropolitan priorities and local council implementation frameworks.

Given that data is aggregated to these broader levels they do not reflect pockets of density or sprawl that may occur within an LGA if a smaller scale were used. Therefore, the data is a reflection based on overall jurisdiction characteristics. This broader level spatial data aggregation on an LGA level is largely in line with how the primary data collection was approached, particularly from the perspective of local council-based planners.

The provision of park typology and function further illustrates the context in which planners are expected to implement new open space to meet city-dweller requirements. These categorisations of open space are pertinent not only in terms of spatial access and land availability within existing infrastructure, but they also have a bearing in relation to community expectation and engagement outcome as they too emerge as a significant theme for planners.

As noted above, the concept of land resource allocation and the secondary data analysis of current and future urban density and land use for open space provision provides context and validation to planners' perspectives as provided in Chapter 6. Furthermore, it also acts as a triangulation tool for both the findings of this research and the broader literature as further discussed in Chapter 7.

In short, the secondary data analysis in this chapter illustrates the lack of total land percentage allocated to recreational open space across Greater Sydney. It further illustrates the ramifications of population forecasting and future housing demand on open space provision across Sydney. As a rapidly densifying city (as indicated through population growth and implied housing demand forecasting data) Sydney is already in some areas facing a lack of open space provision. This problem is likely to become more pronounced based on current forecasting and urban growth trends. Analysis of current and future urban density and land use for open space provision also indicates that traditional open space standards are inadequate for Sydney's future growth. Population and population density are set to rise across Sydney, along with greater housing requirements/density to accommodate the projected population influx, which in turn means that land for open space provision, existing or future, is going to be under an increasing burden. Land is also going to

become more sought after in relation to other amenity and infrastructure required to serve the increased population. Therefore, more needs to be done to understand open space provision inadequacies so that solutions that are functional and sustainable can be found.

This includes both quantifiable data based on current open space standard measuring and reporting practices, and through the qualitative expert experiences from stakeholders with a vested interest in open space outcomes. Especially those of planners, as they are under-represented across the literature, and they are best placed to provide a balanced opinion as to the true precariousness of open space provision as it currently and is likely to be considered and experienced.

Chapter 6: Findings from state and local planner perspectives

6.1 Introduction

This research explores local authority decision-making environments facilitating the provision of a key element of liveable and healthy cities: parks. This chapter is the last of the findings chapters and provides the results from the primary data collection component of the research. The chapter is divided into 8 sections. The first section provides context for data collection and presentation within this chapter. The second section discusses the first theme to emerge from the research: funding. The third section discusses the second most significant theme to emerge from the research: land. The fourth section discusses community expectations and engagement. The fifth section discusses open space standards. The sixth section discusses policy priorities and objectives. The seventh section discusses park innovation. This is followed by a summary of the primary data findings

The geographic, political, policy and resource allocation constraints, and future projections for open space provision discussed in Chapters 4 and 5 highlighted a series of challenges faced when considering distributing resource allocation and future scenario planning in park provision across Sydney. The current chapter puts these ideas into a living context, by drawing on state and local planner perspectives in relation to new park provision and implementation.

6.1.1 A note on context

The aim of the Delphi study and semi-structured interviews was to gather the opinions of state government entities and local council planners regarding the barriers and enablers to new park provision across Sydney, and to assess whether experiences and opinions differed between brownfield and greenfield LGA areas. Participant responses were thematically analysed, and results were mixed in some

areas, although in others a consensus emerged. Participant responses were analysed based on three main allocations:

1. Whether the participant identified their jurisdiction as part of a brownfield or greenfield LGA.
2. If the participant identified their jurisdictional responsibilities to fall into a catchment area of an inner, middle or outer suburban ring location (provided to participants in the survey tools located in Appendix B and replicated as Figure 3).
3. If participants were either state government entities or local council representatives.

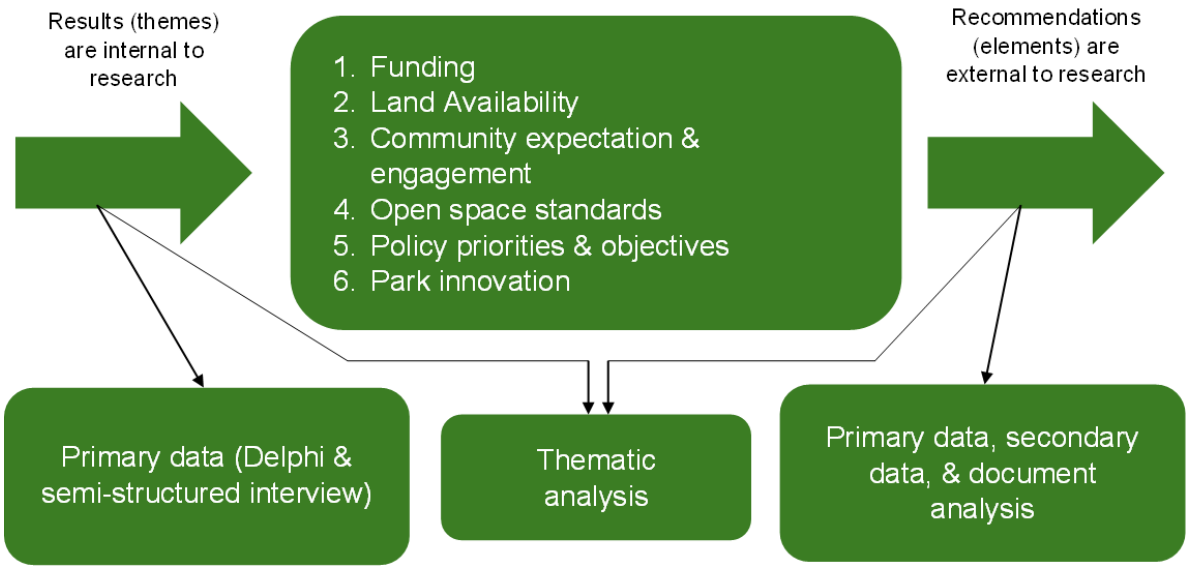
Where possible and relevant, state government based and local council-based participant perspectives have been separated as indicated by their respective terms. If the phrase “participant” appears without a precursor it infers participation from state based and local council perspectives. Where possible and relevant, if opinions differed between Delphi participants and semi-structured interview participants these are also separated. Where direct quotations from participants are provided, these are allocated to either Delphi participants or semi-structured interview participants. As discussed in Section 3.6.1 “Data ethics and protocols”, participant anonymity was a key factor of the research, therefore every effort has been made to uphold these values.

6.2 Findings from the Delphi and semi-structured interviews

Six themes/elements emerged from the research. This chapter primarily focuses on the six themes to emerge from the Delphi study and semi-structured interviews component of the research. They form part of the basis for the six key elements, identified as essential to open space provision, in the following chapter. These are listed below in Figure 15 to illustrate how they are identified and informed through the various methodologies used across the study as a whole.

The six themes for new park provision identified from this research are: 1) Funding availability; 2) Land availability; 3) Community expectation and engagement; 4) Open space standards; 5) Policy priorities and objectives; 6) Park innovation.

Figure 15
Summary of themes vs elements



Source: Author.

Figure description: Figure 15 is a flowchart that shows the six themes of the research and how they relate to the methodologies used. The first box lists the six themes with the text “1. Funding, 2. Land availability, 3. Community expectation & engagement, 4. Open space standards, 5. Policy priorities & objectives, 6. Park innovation”. There is an arrow pointing inwards towards this box with text above it saying “Results (themes) are internal to research”. This arrow has smaller arrows pointing towards two boxes – “Primary data (Delphi & semi-structured interview)” and “Thematic analysis”. There is an arrow pointing outwards from this first box with text above it saying “Recommendations (elements) are external to research”. This arrow has smaller arrows pointing towards two boxes “Primary data, secondary data, & document analysis” and “Thematic analysis”.

6.3 Funding

6.3.1 Funding availability

Funding availability was the first theme to emerge from the research. Lack of funding emerged repeatedly as a theme throughout the findings, as different avenues and attributes of new park provision were explored, including barriers, enablers and means of improvement for new park outcomes. Most aspects of park provision within the decision-making process were highly dependent on funding availability. Broadly speaking, participants supported an increase in the availability of funding, be it in the form of state government grants, better developer contribution mechanisms (for example, voluntary planning agreements that favoured council needs instead of developer profit) or other sources to improve park provision outcomes, including more prescriptive measures by NSW state government that would allow local councils to push back on developers using the resources they already had. Actual funding was considered more important by participants overall compared to developer offers of voluntary planning agreements, which may be explained by the perceived unreliability of developer voluntary planning agreements, discussed in greater detail below. Precinct development was seen as the most effective means of new park provision across Sydney, while the low priority afforded to parks compared to other urban infrastructure and/or amenities emerged as both an inhibitor and secondary theme.

Beyond developer contributions and the complicated power dynamics and inherent tensions therein, funding from state grant programs and other resources was still a concern. This applied particularly to split-grant funding options, which were not always financially viable for local councils to consider. Nor was full grant funding enough to cover the cost of available land for park provision, for the facilities expected by the community or for the amenity to function. These ideas are explored in the findings below.

Local councils in greenfield areas were, overall, slightly less concerned with the availability/opportunity of funding for new parks, as they had more land at their disposal. According to participants in the semi-structured interviews, local councils in greenfield areas were benefiting from a renewed focus on government investment in greenfield areas more generally and, compared to brownfield areas, could build in

park provision with greater flexibility and design considerations. In this regard, they benefited from not having to work with as much existing infrastructure or legacy projects, meaning they could concentrate on good-quality open space outcomes on a broader precinct level and were not as hampered by surrounding land uses. Participants in greenfield areas when considering open space amenity design looked towards brownfield areas for guidance. This was because they felt brownfield areas had been more established for longer, potentially had greater resources at their disposal and therefore would provide examples of best practice that went beyond the notions of traditional mid-20th century park design of basic play equipment.

6.3.2 Developer contributions

There was a degree of vulnerability expressed by several local council-based participants regarding the imbalance in the power dynamics between local councils and developers. Participant experiences indicated that urban planning favoured developers' aims over those of local councils and this was a concern expressed by participants in both brownfield and greenfield areas. As one state government-based participant stated, "What the developer deems to be for the public good, and what professional open space and recreation planners deem are for the public good are polar opposites…" (Delphi participant).

The impression of participants in greenfield areas was that they were more susceptible to developers' pressures than their brownfield counterparts. Further examination revealed that perceptions differed between brownfield and greenfield local councils regarding developer pressure, but brownfield councils also felt under pressure from developers regarding open space outcomes. Some participants from greenfield areas expressed their previous reluctance to negotiate with developers regarding good-quality open space provision, compared to those from brownfield areas. This was because of their concerns that developers would take their business elsewhere, to higher-value and more established areas, if they received too much resistance in the form of local council bargaining for more and/or better resources. In reference to developer obligations to provide good-quality open space in line with community expectation and local council aims, they felt that brownfield areas had more bargaining power to push for better open space outcomes within a development application because the land values were higher and the surrounding

amenity more established and this gave brownfield areas greater appeal for developers than greenfield areas.

Participants from brownfield areas did not explicitly say that they had any more bargaining power than their greenfield counterparts when it came to developers and ensuring developers met their open space provision obligations. They intimated the pressures were different and thus hard to compare. However, in some cases, brownfield area participants reasoned that greenfield areas had greater land supply, which made it easier to provide parks that were more in line with open space standards and community expectation. Greenfield area participants agreed that providing parks was easier in terms of available land than it would be if they had to fit them into existing amenity and infrastructure constraints, such as those found in brownfield areas. However, as noted previously, many participants in brownfield areas, like their greenfield area counterparts, felt they were at the mercy of developers and that to achieve appropriately resourced or functional park provision was a struggle. This was in part due to existing infrastructures but also compounded by pressures from NSW state government regarding infill development and by developer tactics and priorities that frequently overrode original negotiations with local councils regarding open space provision. As one participant explained:

> Those other infrastructure provisions are hard-wired necessities and do not generally present as a choice, they are a must-have. Parks on the other hand are a nice-to-have. From the developer's perspective, the immediate surrounding infrastructure is critical to the aesthetic product being offered. (Delphi participant)

The question of whether developer contributions were adequate for new park provision across brownfield and/or greenfield areas alike yielded mixed responses among the round one Delphi cohort. Participants held a range of views that were not necessarily correlated with their own jurisdictional situation. This included a mixed response from state government-based participants. Of the possible responses, six participants identified developer contributions as being inadequate in both brownfield and greenfield areas. Three participants found developer contributions adequate in greenfield but not in brownfield areas, and another three participants found the opposite, that developer contributions were adequate in brownfield but not in

greenfield areas. Finally, one participant found them adequate in both brownfield and greenfield areas.

Additional findings from across the Delphi and semi-structured interviews, according to overall participant responses, revealed that greenfield developments were likely to be cheaper for developers than brownfield developments, yet less profitable economically. This was because greenfield developments did not enjoy the same return on investment as brownfield areas, in turn owing to a higher mark-up in brownfield areas than in greenfield areas due to park access. The participants who believed developer contributions were adequate in brownfield but not greenfield areas reasoned that brownfield site developments were likely to require higher costs, which then translated into higher developer contributions that could be factored into higher-quality park provision outcomes. Whether or not there was a direct correlation between higher developer contributions and better park outcomes was not forthcoming. The participants who believed developer contributions were adequate in greenfield areas but not in brownfield areas cited the lower cost of land in greenfield areas, and the greater likelihood that park sites would be designated during the land-use planning stage. Developer contribution caps were problematic in either scenario as they limited what could be achieved in terms of park outcomes. Most participants in the Delphi and semi-structured interviews thought the process of open space provision through developer contribution resourcing avenues favoured the developer and not the public, noting that the tactics that developers used to maximise profits included legislative appeals, constant minor changes to original approved plans once the projects were underway and attempts to include stormwater swales as open space provision for community use.

When considering a comparison of state government-based or local council-based participant responses, the majority of NSW state government participants were more likely to agree that developer contributions were adequate in brownfield areas but not in greenfield areas. Conversely, local council participants were more likely to agree that developer contributions were not adequate in brownfield areas but were adequate in greenfield areas. A majority of local council participants stated that developer contributions were inadequate in both brownfield and greenfield areas.

Further enquiry revealed that the sole participant who believed developer contributions were not important had reached this opinion because of a lack of land

for new park provision in their jurisdiction. Additionally, current land zoning laws disallowed high-density development, which meant that, as a provider of new parks, they could not capitalise on voluntary planning agreements with large developers. As they explained, local council priorities were focused on improving existing green assets and examining alternative measures to increase the public space footprint across the jurisdiction (Delphi participant). Another participant whose jurisdiction was in a similar position regarding lack of available land for new parks agreed that voluntary planning agreements were somewhat important, but they were contending with greater densification and more rapid infill across their jurisdiction. Although developer contributions were available for improving open space, scarcity of land meant there was no capacity based on land zoning at the time for new park provision (Delphi participant).

When considering the topic of voluntary planning agreements, of the possible responses, four participants identified voluntary planning agreements as being more effective in brownfield and greenfield areas alike. A further three participants indicated voluntary planning agreements were more effective in greenfield but less effective in brownfield areas. Three participants took the opposite stance, stating voluntary planning agreements were more effective in brownfield areas and less effective in greenfield areas. Lastly, two participants stated that voluntary planning agreements were equally ineffective in both brownfield and greenfield areas.

6.3.3 Comparing developer contributions and voluntary planning agreements

When considering developer contributions compared to voluntary planning agreements, neither were seen as adequate. However, local council participants intimated they had no choice but to make the best of the situation and attempt to gain the highest quality outcome for the community within the constraints of developer offerings and current policy as a primary source of park provision. Overall, voluntary planning agreements were seen as more effective, and in more places, than developer contributions. However, participants gave five reasons for the inadequacy of developer contributions across brownfield areas and/or greenfield areas:

1. Caps on developer contributions
2. Restrictions on how developer contributions can be spent

3. Land zoning restrictions (which involved land currently unable to be rezoned for higher-density development, therefore, higher-density developments could not be capitalised on to provide new park provision)
4. Ongoing maintenance costs and upgrades for parks that were not considered as part of the initial development approval process
5. The prohibitive cost of land, even if it were available, which neither developer contributions nor state funding grants would cover.

One argument for voluntary planning agreements being less effective than developer contributions was offered by a participant who explained that in their jurisdiction, voluntary planning agreements yielded poor outcomes for the community, but developer contributions offered the local council some income that it could put toward a park that would meet the needs of the community (Delphi participant).

Overall, the responses were mixed among the participants. Three participants indicated that developer contributions were more effective in greenfield areas and voluntary planning agreements were more effective in brownfield areas. Three participants indicated that voluntary planning agreements were more effective in greenfield areas and developer contributions were more effective in brownfield areas. Four participants indicated that voluntary planning agreements were more effective in both greenfield and brownfield areas and one participant indicated that developer contributions were more effective in both greenfield and brownfield areas.

When examining developer contributions in further detail and considering the relative merits of in lieu contributions towards park provision on a yet-to-be-identified site versus negotiated contributions of an actual site, the consensus was that both options were flawed. Of the three participants who indicated that one option was less flawed than the other, two proposed that in lieu developer contributions were less flawed than negotiated contributions as they allowed for local council to choose where resources could be used to better serve the community rather than relying on developers to provide quality open space. One participant reasoned that negotiated contributions for an actual site was less flawed, because this was due to what were likely to be less reliable standards of park provision on the actual site, explaining:

> When developers have more authority than the local council over the final site attributes, outcomes are less likely to follow good-practice guidelines or meet community demand. This was because market interest largely drove developer interest, whereas the local council is beholden to the community. However, on a yet-to-be-identified site for the provision of open space that is not designated by the developer, but is instead identified and provided by local council, local councils have accountability measures to which they must adhere, and therefore ensure that open space standards are met, and community need is taken into consideration. (Delphi participant)

State government-based and local council-based participant perspectives differed regarding the most effective type of developer contributions. State government-based participants favoured negotiated contributions, whereas local council-based participants favoured in lieu contributions.

However, one participant who favoured in lieu contributions to park provision on a yet-to-be-identified site for open space provision not designated by the developer but instead administered by local council, had reservations regarding the system, explaining:

> There are pros and cons with both. In lieu contributions (i.e., Section 7.12 levies) are identified in a council's contributions plan with the amount payable clearly stated and works schedule indicating the public facilities for which the levy will be applied towards. This is a transparent process set out in a considered, council-adopted policy. Negotiated contributions (i.e., voluntary planning agreements) are ad hoc and dependent on a site being redeveloped (by developers) and a suitable agreement being reached. An increase in density (i.e., height or floor-space ratio above that provided under the council's local environmental plan) is typically sought by the developer in return for providing a public benefit (e.g., park) on the site. Is it reasonable that a development breaches the community and council-endorsed local environmental planning standards, in return for a public benefit such as a local park? The answer may depend on the circumstances. Community

> consultation is important, and consideration of the council's vision for the area. (Delphi participant)

Participants from the Delphi and semi-structured interviews in greenfield areas and outer suburban area locations echoed the opinions of brownfield participants regarding how developers attempt to redefine greenspace definitions for their own benefit and to avoid providing open space for parks in any meaningful sense. For example, “...developers offering up untenable greenspace lands as open space such as water easements, electrical line easements, swamps” (semi-structured interview participant, personal communication, 23 August 2022).

There was a clear consensus among participants that since voluntary planning agreements are a negotiated outcome, there was a need to improve local authority negotiating skills and this would improve park provision outcomes. However, what improving negotiating capacity could look like for local councils was not forthcoming in the findings of this research. As noted above, this research indicates that local councils are vulnerable to being taken advantage of by developers owing to what local councils experience as power imbalances in the broader system of urban planning. This includes the legislative avenues open to developers and the fact that state government interests are market-led and focused on growth rather than community-led and place-based.

The majority of participants in the Delphi study agreed that increasing developer contributions would improve park quality outcomes without impacting other public goods. Similarly, the semi-structured interview participants saw developer contributions as inadequate in terms of financial and land contributions. Larger precinct developments were not only easier to plan for in terms of park provision, but voluntary planning agreements in these instances were proven to be more dependable and suitable. For smaller developments and sub-divisions, financial contributions were more likely but were not adequate as a means of funding parks.

Participant responses were mixed from as to whether land in kind or voluntary planning agreements were more effective, and which area (brownfield or greenfield) had the upper hand when it came to negotiating with developers. Participants in greenfield areas reasoned that developer contributions in brownfield areas would yield higher profits, and they would therefore be more attractive to developers, while

participants in brownfield areas reasoned that greenfield areas offered more flexibility when park provision was part of a development, because it would not be impeded by existing urban form.

> As previously discussed, in a greenfield area, there is greater access to land. Provision of a new park is typically a feature of new communities and can be provided and embellished by the development. Within redeveloping areas, land costs are too high and while minor ground plan open space can be delivered (Central Park, Ultimo) such provision is only possible on large sites and not possible on urban renewal/infill areas without specific policy provisions in place. (Delphi participant)

When considering alternatives to traditional developer contributions, the response by participants was cautious. Private/public partnership parks were seen as a possibility beyond the traditional developer contribution model, even though the latter was the most popular and currently preferred model. Developer contributions were also preferred over other models of public/private partnerships based on familiarity with the system. The perceived mutual benefit between public and private investment, for example, voluntary planning agreements (VPAs), which provide a higher hedonic value for developer sales and in turn increase council rates and public benefit through new park provision, were the most easily recognised means of valuing the provision of open space by developers, which is why participants likely found it useful when negotiating VPAs. However, further information on this topic was not forthcoming in this research.

6.3.4 Park maintenance costs

When state government-based participant perspectives were compared with local council-based participant perspectives regarding the influence of park maintenance costs in decision-making mechanisms, a significant difference was exposed. State government entities were unconcerned with park maintenance costs compared to local council-based participants. This is because, as participants pointed out, the state has 0% responsibility for park maintenance and local councils have 100% responsibility. As one participant explained in relation to local council financial allocation:

> In narrow financial terms the public benefit of local parks is evaluated by the elected Council every year when it debates and adopts its annual budget, allocating operational or maintenance funding to all parks (at different service level standards) and capital works funding to specific parks that have been prioritised for a range of capital projects that are categorised as either an asset “upgrade”, an asset “renewal” or a “new” open space asset. In general terms, the public benefit of local parks are evaluated by Council when it consults, prepares and adopts its strategic policy documents, such as its Recreational Needs Study, Play Space Strategy, and public land plans of management. (Delphi participant)

Further, the weight given to park maintenance costs when considering new or existing park provision varied between local council-based participants themselves. This was regardless of how the park was originally funded, either as a state government grant or some form of developer contribution. Depending on land availability, community demand and the broader financial position of the local council, the maintenance costs of a new or existing park were reportedly approached differently among local councils in the overall decision process. Some local council-based participants thought it held very little weight, others gave it a medium weighting, and others thought it one of the most important considerations for new park provision. For example, one local council-based participant revealed that of course some consideration was given to the upkeep costs of a new park, but it was not a determining factor as to whether a park would be provided or not (Delphi participant).

For another local council participant, maintenance costs were a key consideration for either a new or a redesigned park, although this participant provided the caveat that their budget for park space maintenance differed from that of other local councils (Delphi participant, personal communication, 20 April 2022). Several other local council Delphi and semi-structured interview participants agreed that maintenance costs of new parks had to be factored into the broader park provision costs and annual budget, and increasing park provision meant the annual upkeep budget also had to increase to accommodate these costs along with upgrades already earmarked for other assets. Another local council-based participant explained that maintenance costs were not fully covered by budget allocations:

> The community wants better parks – instead of just a playground – they want adventure playgrounds, off-road bike tracks etc for their kids. This type of open space is expensive to establish and expensive to maintain. It is also easier to levy for the embellishment of open space rather than acquisition of open space. (Delphi participant)

Another local council-based participant held the opposite view, positing that maintenance costs had very little impact on new park provision, stating that compared to the upfront costs of new park provision, such as land acquisition, maintenance costs were insignificant. They went on to explain that the main barrier to park provision was the cost of land and land redevelopment (Delphi participant). As noted above, neither developer contributions nor state government grant covered the cost of land for open space provision.

When comparing the influence of maintenance costs between brownfield and greenfield areas on park provision, an interesting anomaly emerged, namely that the park maintenance budget was of greater concern for greenfield than for brownfield areas. One explanation for this came through in the semi-structured interviews, when a participant explained that because greenfield areas were not as well-established as brownfield areas, and because land was so readily available, park upkeep was not a concern. This was because there was more concentration on building other amenity and infrastructure, on population growth and on attracting employment/lifestyle opportunities and economic interest to the area. Additionally, there was simply not the same community demand overall for park upkeep as in brownfield areas. Since land was, and continues to be, readily available for park provision and the council does not have to ‘buy’ it the way brownfield areas do, maintenance costs seem huge compared to the cost of land acquisition and are not something the council concerned had had to consider previously (semi-structured interview participant, personal communication, 23 August 2022).

Some local councils were more long-sighted than others when considering park provision and upkeep, while others seemed less concerned about the effect of population growth and its consequences on the strategic placement of parks or future community demand for open space. There was no substantial difference between brownfield or greenfield considerations of park upkeep; rather, it was each local

council's budget that dictated how much open space they could maintain, their priorities and forecasting preferences.

6.4 Land

6.4.1 Land availability

Land availability was the second theme essential for park provision to emerge from the research. A consensus of participants thought that the bearing of land availability on park provision was very important. Two participants who said land availability near identified park need was somewhat important were followed up. Correspondence revealed that one of these participants considered their experiences over a range of previous jurisdictional responsibilities and these situations (and other factors) influenced their knowledge of park provision and hence their initial response. In their current role, however, where land availability was a significant factor that influenced traditional park provision, but no land was available for new park provision in their jurisdiction, innovation of existing public space became more important. The second participant, however, noted that from a greenfield perspective land availability near an identified park need was not a pressing concern as there was an abundance of land available to create the amenity and they did not have to squeeze something into an area already heavy with infrastructure. This participant continued by explaining that their local council followed community priorities, which were directed toward active recreational pursuits, and adequate land was still available to keep up with community demand for new park provision, if required (Delphi participant).

In both the Delphi and semi-structured interviews of this research, the theme of land availability near identified park need was not considered as important in greenfield areas as in brownfield areas, presumably because greenfield areas had more land at their disposal. Nevertheless, land availability near identified park need emerged repeatedly across all jurisdictions as a current and future concern for the provision of parks, particularly when anticipated population growth was taken into consideration. Participants from brownfield areas were especially concerned about future park provision but also acknowledged that the system was imperfect in already established areas where competition for infrastructure priority was high. They were therefore making do with what they had, rather than planning for impossible outcomes. As several participants explained, planning was a compromise between

theory and what can be realistically achieved. Some participants indicated that it was not worth concentrating on land availability near park need as such, especially where land was not available. Rather, it was more productive to concentrate on where potential open space could be preserved within the constraints of other priorities essential to city-building, and to improving existing amenity. Two local council-based participants conceded they had run out of available land for new park provision and were instead focused on the alternatives of improving existing park assets, other natural assets, and high-street activations. These local council-based participants acknowledged that they were reliant to some extent on the spill-over effects of active and passive forms of open space in neighbouring jurisdictions. One local council-based participant offered the following example:

> This could be street interventions such as pocket parks, a small civic space, road closure to create a good-quality pedestrian environment and other spaces that might not necessarily be recognised as a local park but otherwise function as open space. (Delphi participant, personal communication, 12 August 2022)

6.4.2 Park size

The consensus by participants in the pilot and round one Delphi study was that local councils do not prefer larger parks over smaller parks because of the shared cost arrangements with state government, meaning that local councils would in theory be better resourced to implement such provisions. Of the participants who disagreed with this consensus, one represented a state government entity and three were representatives of local council located in middle suburban ring locations that had a variety of alternative open space at their disposal. Nor were they concerned that park maintenance would be an ongoing financial burden in their jurisdictions. As noted above, this may be explained by the coincidence of enough open space and budgetary capacity.

Further enquiry revealed larger parks were more expensive than smaller parks for local councils to maintain. Larger parks were considered harder to implement in accordance with current planning practices and guidelines regarding NSW recommended open space standards. Barriers to local councils considering new and larger parks, particularly in brownfield areas, included a lack of land supply, a need to

satisfy access by distance to greenspace based on surrounding population density ratios, and a state government push for transport-oriented development that does not prioritise larger park provision. As stated by one local council-based participant:

> If there are not large parcels of land, larger regional/district parks cannot be considered, no matter the enticement offered by the state government. Open space standards are easier to reach with small park allocation than they are with large park provision, particularly in redeveloping areas where small plots of incidental land may be available for conversion or rezoning. (Delphi participant)

Participants in the semi-structured interviews tended to agree with the consensus of the Delphi participants and explained why smaller parks were viewed as a better option for local councils. These participants were quick to point out that dollar-for-dollar grants were not adequate as funding sources and in some cases inhibited park provision, especially at the regional/district scale. This was because local councils simply could not afford them, either financially or in kind. Participants gave no further indication regarding what percentage of subsidy would be required to ensure the feasibility of works in kind, or shared payment schemes for parks; the merits of each opportunity are considered on an individual basis specific to the proposal or state government initiative in question.

A further explanation for larger parks as not being a preference for local councils could be tied to the finding which indicated that, as stated by one participant, they considered state/metropolitan strategic priorities were more aligned with larger district/regional parks, and less so with local park provision, indicating a mismatch between state greenspace concerns and local council localised concerns and capacity to deliver in line with community requirements or existing urban form (Delphi participant). Several participants suggested that state government did not appreciate the variation in local councils across the Sydney metropolitan area or consider the needs of the local community and used a blanket approach to public open space provision which was difficult to implement at a local level.

6.4.3 International comparisons of open space provision

Participants in the Delphi study and semi-structured interviews observed that Sydney was struggling with existing infrastructure that was dysfunctional, hindered by

limited public and active transport options, and possessed a lack of open space provision innovation and consideration compared to elsewhere around the world. They felt that Sydney struggled to acknowledge community expectation and usage compared to how those expectations and uses are acknowledged and specifically catered for by comparable cities with similar global aspirations and status.

6.4.4 Land supply processes

The majority of participants across the Delphi and semi-structured interviews expressed growing concerns about lack of land supply for local parks, and the low prioritisation and processes regarding the future of park provision in their jurisdictions, particularly (but not exclusively) in brownfield areas. Several Delphi participants revealed in follow-up correspondence that they felt there was little they could do to mitigate their concerns. This was due to the strength of market drivers and the push for economic growth by the state government as a priority, such that it outweighed the public, social and environmental benefit of park provision. One Delphi participant offered the following explanation regarding how their jurisdiction were approaching the conundrum: “The strategy within the plan is to focus on strategic areas for acquisitions based on the principles of no net loss, improved access and connectivity, innovation and collaboration” (Delphi participant).

Land availability was inextricably linked with the cost of land and was problematic in brownfield areas. The experience of local council-based participants in greenfield areas was largely the reverse, due to greater land availability. As stated previously, land was less expensive in greenfield areas, though as noted by most local council-based participants in those areas, it would become a challenge in the future, proportionate to densification. One participant stated:

> Purchasing of land for recreational purposes occurs in line with population and suburb growth and we look to always deliver based on what is required, if this involves field extension to meet field requirements, then we aim to deliver in accordance. (Delphi participant)

According to several local council-based participants in brownfield areas, a challenge facing park provision when considering land availability near identified park need was that it did not appear to be problematic on paper in terms of population/density ratios when scaled out to consider the LGA. However, if land

availability near identified park need was scaled down to consider pockets of the LGA, the data became problematic, with certain parts of the LGA being under-served compared to others. When functional uses of park provision were taken into consideration, such as walkability or access by distance, or place-based outcomes which are more reliant on community patterns of use that differ from standardised park-per-capita calculations, many parks were either under-utilised or over-utilised. As one participant explained:

> This was a growing concern for the future as land was not available for park provision where the community wanted it most, nor was land going to be available for park provision or sporting facilities where infill development had been earmarked across the LGA. (Semi-structured interview participant, personal communication, 16 August 2022)

The opposite stance was taken by one local council-based participant when considering land availability near identified park need in terms of population/density ratios on an LGA scale. In their situation, park provision appeared problematic on paper, in terms of population/density ratios; that is, parks were under-provided. If functional considerations of park provision were taken into consideration based on local resident usage and the spill-over effect of neighbouring park provision and other open space amenity, and park provision were scaled up to a regional level, then in terms of population/density ratios for park provision, they would be more likely to reflect park provision requirements (Delphi participant).

Common to state government-based and local council-based participants across jurisdictions regarding land availability for park provision was how parks fitted into existing or planned infrastructure/surroundings and urban characteristics. Three considerations emerged in relation to land availability:

1. Parks may be supplemented by open space amenity in neighbouring jurisdictions that may include walking/mountain biking trails, green corridors, sporting facilities and/or nearby national parks that could or were being used by the community in lieu of more traditional parks.
2. The existence of current or future precinct plans, dwelling density forecasts and infill development predictions might affect estimates of current need. Sometimes this meant local councils would hold off on a new park provision

until further plans were in place, to ensure the best long-term outcome for local residents, based on the planned precinct or master plan development rather than meeting the immediate community demand.

3. Land availability for park provision in brownfield and greenfield areas differs. The approach to park provision in brownfield areas is one of pragmatism, as options are already limited compared to greenfield areas. In brownfield areas, a higher priority is given to the mere availability of land, where possible park provision is given priority if adjacent to other appropriate amenity or community need. Land availabilities are especially important when local councils have the comparative luxury of providing options for park provision via alternative available land parcels, such as for new precinct plans or from relatively low existing or planned population density, such as in greenfield areas.

A further three attributes were of lesser or no significance when determining land availability for new park provision, based on the Delphi pilot and round one survey and briefly touched upon in the semi-structured interviews:

1. The physical attributes of the area (such as land-use attributes), slope topography and vegetation. These characteristics are likely considered less important because of the land supply challenges, particularly in brownfield areas. This is compounded by the exorbitant cost of available land, actual land topography and the nature of the developer contributions system in relation to voluntary planning agreements (VPAs), an area where local councils intimated a sense of powerlessness when negotiating for open space outcomes for their communities that were of high quality and functionality.
2. Although the participants themselves did not explain their preference for Crown Land, one explanation is that Crown Land is effectively community land in a local council context; local councils do not need to buy it, and they need only to take into consideration its upkeep.
3. Participants did not discuss historical and Aboriginal Peoples culturally significant site attributes, so no further insight was gained in this research.

When asked to prioritise drivers (pressures) behind planning for new parks, based on metropolitan location (inner, middle or outer suburban ring), participant responses were mixed, irrespective of whether they were state government-based or local council-based participants in brownfield or greenfield areas. This applied to all the metropolitan locations in terms of assigning a level of importance to new park sites. Delphi participants from brownfield areas indicated an acute awareness of the implications of park provision across the built-up inner suburban ring, middle suburban ring and outer suburban area locations. They indicated the middle suburban ring locations as marginally more important for park provision on a metropolitan-wide scale than both the inner suburban ring and outer suburban area locations. This was not something that emerged in the semi-structured interviews of the research, as assigning a level of importance to new park sites based on broader locational values such as a metropolitan scale did not seem relevant, as participants expressed more focus on their own jurisdictions. There appeared to be a degree of pragmatism at play within the semi-structured interview participant attitudes and responses to this question, and further discussion regarding metropolitan planning priorities. Semi-structured interview participants expressed a focus on what they could reasonably achieve and control within their jurisdictions regarding open space provision and did not dwell on decisions and vertical hierarchy power dynamics of NSW state government concerns or ideals.

6.5 Community expectation and engagement

Community expectation and engagement was the third theme to emerge from the research. Community demand was seen as a vehicle for new park provision by all local councils and was engaged by all local councils according to local strategic plans (LSPs) and various other mechanisms embedded into their Integrated Planning and Reporting (IP&R) framework. In the outer suburban ring and middle suburban ring, community demand was frequently more focused on active recreation spaces, rather than the traditional passive recreation spaces, such as the smaller parks favoured in the inner suburban ring. A consensus was reached, indicating that the community would benefit from having a greater understanding of the mechanisms involved with new park provision, as this would enable greater collaboration and better outcomes between stakeholders.

According to participants across the Delphi and semi-structured interviews, community demand for types of open space differed between brownfield and greenfield areas. When participant responses were examined more broadly, a common trend across all state government entity and local council jurisdictions emerged, indicating that the community expected more sophisticated open space, and local councils in particular were having to find more innovative ways to respond to this growing demand. However, this was proving challenging and the gap between community demand and government capacity to deliver on these requirements was increasing. In brownfield areas, community demand was a strong factor in influencing park provision, but there were unresolvable tensions between community demand and local council capacity to meet that demand. This tension was rising as densification continued, yet land for new park provision has become increasingly scarce. The community demand in brownfield areas focused more on play space, adventure play, skate parks, bike tracks, inclusivity and access, modern facilities such as toilets, and play equipment such as wheelchair-accessible carousels and large climbing frames. According to local council-based participants in brownfield areas receiving this community feedback, such amenities were expensive to build, expensive to maintain and not always feasible in the locations the community demanded. This is not to say there was no growing demand for active open space in brownfield areas, as that too was an emerging concern, yet with less land at their disposal, the focus naturally returned to making the most of the resources available.

In greenfield areas, community demand was focused more on active open space such as sporting fields, trails for mountain biking, bouldering and other active pursuits. According to greenfield local council-based participants, the community demand for play spaces were less than in brownfield areas. At the same time, greenfield local council-based participants across the region were looking towards brownfield areas for best-practice examples and innovation in playspace amenity design as a means of moving forward. This applied not only to the creation of new playspaces but, as one participant explained, much of their existing play equipment was coming to the end of its use and needed replacement. They therefore wanted to provide better playspaces for the community compared to what was previously available (Semi-structured interview participant, personal communication, 23 August 2022).

A common concern among participants across the Delphi and semi-structured interviews was the lack of resources, be it funding, land, the limited access to affordable innovative solutions, or the lack of power local councils had to meet these growing and changing demands from the community for open space. According to participants across the Delphi and semi-structured interviews, the mismatch between community demand and local council capacity to supply parks had six components. These were as follows:

1. A lack of funding to acquire land even if land was available, or in locations suitable to meet community demand.
2. Community resistance to compulsory land acquisition to accommodate local resident demand for park provision.
3. Local council and community resistance if politicians and/or constituents perceived an economic loss. An example would be small businesses objecting if existing car parking spaces were converted to parklets or a park, and access to those businesses was perceived by business owners as being disadvantaged because of that conversion. This was regardless of community support and other evidence suggesting that changes to the high-street amenity would revitalise a place and bring more foot traffic and trade into an area.
4. The time taken by local council to procure suitable land for parks was not in line with community expectation and the community were unaware of the constraints regarding the supply mechanisms of park provision.
5. Ongoing maintenance and cost-recovery mechanisms for higher-quality parks with greater amenity to meet community need, demand and expectation were a concern for local councils and created unresolvable tension between community expectations and council's capacity to meet those expectations.
6. A growing community preference for active over passive recreation areas, which has created an increasing tension between supply mechanisms and community desires, related to both funding and land supply.

Meeting community demand was for local councils less of a challenge in greenfield areas and outer suburban area locations, where land availability for park

provision or alternative open space is greater. The findings of this research conclude that, based on provisional funding, community demand for park provision is more likely to be met in greenfield areas than in brownfield areas. At the same time, park provision is slightly less important for city dwellers in greenfield areas than in brownfield areas, which is why an open space outcome was considered easier to meet. When considering more active recreational pursuits as an open space outcome, both greenfield and brownfield locations were experiencing challenges.

Community demand was considered an element of most aspects of new park provision. Thematically, what emerged was that the participants in this research respected community demand for park provision as an essential and meaningful influence on new park provision. The participants cited the lived experience of the community as bringing valuable insight into community needs and wants. However, as noted above, participants from across the Delphi and semi-structured interviews posited that community demand for park provision could at times be somewhat unreasonable compared to what local council could be expected to deliver given available funding mechanisms including state government grants, developer contributions, rate caps, land supply, land costs and, in some instances, amenity maintenance. Other considerations were of a more technical nature that included adherence to safety standards, open space guidelines, availability and appropriateness of equipment or other amenity, of which the community were often unaware. In addition, these community needs for open space had to be balanced against other local council area priorities.

As stated previously, this research showed that in greenfield and outer suburban area locations, community demand was shifting significantly away from traditional passive recreation spaces to spaces for active recreational pursuits. According to local council participants in greenfield areas, based on the community feedback mechanisms in local councils, local residents were more interested in sporting facilities, outdoor adventure, walking and mountain biking trails and informal multi-use open space for recreation activities. They added that the community viewed these amenities, associated as they were with outdoor lifestyles and being closer to nature, as part of the appeal of outer suburban living. This contrasted with inner-city living, which traditionally provides greater convenience to amenity and employment opportunities. As one participant explained:

> Local parks and playgrounds are great, but due to our Local Government Area demographic, there is a high social value placed on sporting field/active recreation. Strategies would be to place more emphasis on land suitable for active recreation i.e., basketball courts, tennis courts, sporting fields. (Delphi participant)

Another local council participant explained that, from a greenfield area perspective, the land was available to facilitate active recreational pursuits. However, without the formalisation of sporting clubs and the revenue from local club fees, local councils were concerned about finding the financial resources to build, refurbish and/or maintain active recreational spaces to a standard expected by the community, including lighting, groundskeeping, changing rooms and so on (semi-structured interview participant, personal communication, 23 August 2022).

Another participant explained that, at a precinct level, they could team up with a neighbouring jurisdiction such that one local council paid for the aquatic facilities, the other paid for the library, thereby making these facilities jointly available to local residents to meet community demand (Delphi participant).

A similar trend emerged in the research from some middle suburban ring locations, where local residents wanted more active pursuits embedded into their open spaces without the formality of traditional sporting clubs or single-use facilities. According to the majority of participants, this was harder to implement in an outdoor setting, for the very reasons above; funding streams, land availability and local resident demand compared to local council capacity. One solution proffered by several state government-based and local council-based participants in the Delphi study was to include indoor sporting facilities, among other amenity, as ‘functional’ open space provision. As one participant stated, “It creates opportunity for local residents to enjoy recreational pursuits and have this count toward liveability, lifestyle, spatial uses” (Delphi participant).

Community demand was found to be influential on park provision. What the community expected differed across greenfield areas, with some being far more innovative than others in terms of smart park design, particularly when it came to water-sensitive design as a necessity for climate adaptation. However, it was acknowledged that such innovations were expensive, therefore even if local councils

wanted to implement more environmentally adaptive measures in accordance with community expectation, this was challenging. Other greenfield areas, from a community demand standpoint, wanted more traditional twentieth-century forms of park offerings. As noted above, common to all the greenfield areas in this research was a greater community appetite for such sporting facilities such as trails, bike tracks, playing fields and bouldering parks than for passive recreation spaces such as smaller parks.

Findings indicate that where possible, community preference for active over passive recreation is accommodated. While rates were an appropriate source for operations, participants stated that rate caps had imposed wider limits, and no jurisdiction found the rates were adequate to maintain these amenities.

6.6 Open space standards

Open space standards were the fourth theme to emerge from the research. Open space standards, just as with the other themes, frequently overlapped with each other, both as a challenge and solution. There were several considerations relating to open space standards that brought the relevance and applicability of open space standards for open space's standards sake into question, including community use of existing parks, an increase in high-density living now and in the future, and the recognition, if not the uptake, of more innovative uses of land supply for park provision that needed to be considered more thoroughly.

Meeting current open space standards and guidelines for open space provision emerged as a growing concern for local councils in brownfield areas. Traditional per capita open space standards were seen as unrealistically high in brownfield areas, where the cost of land was exorbitant, the availability of suitable new land was extremely limited and infill housing targets were increasing. Traditional catchment concepts related to open space standards were also seen as problematic in brownfield areas for the same reasons. Several local council-based participants called for changes in how open space is considered, evaluated and provided.

As noted previously, a challenge facing several local councils was the underutilisation of existing parks. According to several local council-based participants from across the Delphi and semi-structured interviews, this

underutilisation by the community has created a mismatch between formal open space standards and practices and day-to-day practice that has translated into what one participant termed “land legacy local parks.” They continued:

> These are parks that were donated to the community decades ago in lieu of modern developer contributions. However, they were not linked with strategic planning and are located in ad hoc places, in line with patterns of early subdivision but with little consideration for community use. In other words, they are not where the community need them, access is often poor, and they are under-utilised as a result (Semi-structured interview participant, personal communication, 16 August 2022).

Local council-based participants from brownfield areas thought alternative means of park provision that went beyond the traditional per capita measurement would be more useful in their jurisdictions. They stated that current open space standards were misleading if park function were to be taken into consideration, particularly where untenable terrain and heavy bushland were factors. Open space standards just as with land availability were considered a challenge for brownfield areas, but less so for greenfield areas. Participants stated current open space standards were, and would continue to be, impossible to meet, given the exorbitant costs of land and the limited land supply currently experienced in brownfield areas. As one participant explained:

> With so many different types of passive parks across our open space network – such as parks, neighbourhood parks, district parks… public plazas and civic spaces – which are used for so many different passive recreation purposes, the traditional measurement is not particularly useful. The quality and usability of every parcel of passive open space also vary incredibly, which also reduces the value of the traditional measure of park provision (Delphi participant).

When participants were asked about how open space standards could be considered differently, several solutions emerged. One of the most innovative responses proposed onsite floor-space ratios as a potential alternative to traditional

open space standards-linked open space allotments. As one local council-based participant posited:

> I believe that the provision of open space should be tied with the floor-space ratio, where you have a high-density living proposal rather than the developer building from boundary to boundary. A portion of the site is open space. The higher the density, the higher the open space component (Delphi participant).

Another participant took a slightly different approach, but with similar intent, preferencing higher apartment density over low-density to mid-density sprawl to solve the deficit of open space, reasoning that if the same population were occupying higher-density dwellings as low-density dwellings, there would be more room for open space in an allotted area (Delphi participant). Unfortunately, there was no evidence of this as a practice in either the Delphi or semi-structured interviews.

Population-per-hectare ratios for park provision were referenced by some local councils as a measure for calculating or planning for new park provision. When considering the challenge of applying typical open space standards to their rapidly densifying jurisdiction and high-density, high-population urban centres with limited open space, one participant explained: “This is not appropriate to apply a suburban open space standard and should consider high-street amenity, urban spaces and other (potentially) private or indoor facilities (shopping centres, gym etc), private communal open space” (Delphi participant).

Participants indicated traditional per capita open space standards were seen as unrealistic in brownfield areas where land costs are exorbitant, suitable new land availability is limited, and infill housing targets are increasing. Traditional catchment concepts related to open space standards were also seen as problematic in brownfield areas in this research for the same reasons. As one state government-based participant explained:

> Per capita at Local Government Area level assumes that parks are utilised predominantly by local users as opposed to visitors. Many of our areas draw people from a broader area. Park provision needs to be more regionally and functionally focused (Delphi participant).

Participants were each enthusiastic about a more considered and functional approach to open space/park provision means of measurement that better reflected local environments and community use. There was a desire for these measures to encompass a wider variety of public space opportunities, such as including the public space and outdoor facilities offered by schools or indoor active recreation facilities, while excluding other open space provision currently included as part of open space standards from measurement calculations that were less functional for community use but still provided an enormous public and environmental benefit. These include features such as heavy bushland, steep typological forms such as cliffs or mountains, heavy vegetation and stormwater swales.

6.6.1 Population and dwelling type

A majority of participants in the Delphi study stated that population density and dwelling type were “very important” in relation to new park provision. Those local council-based participants who indicated population density and/or dwelling type were “somewhat important” had either lower density levels overall or had at their disposal more alternative forms of open space and/or blue space, such as national parks and/or beaches and waterways, than other local councils. Population density and dwelling type were considered “very important” in relation to new park provision by most state government-based participants. The impacts of population density and/or dwelling type were more pressing in brownfield areas with less overall land availability compared to greenfield areas. While local council-based participants from greenfield areas knew that population density and/or dwelling type affected decisions on the location, type and size of new park provision, particularly on a new residential precinct level, especially where high-density dwellings were predicted, they acknowledged their local councils had more flexibility regarding new park provision than councils in brownfield areas.

In relation to open space provision, population and dwelling type, categorised by either local council-based brownfield or greenfield participant responses, responses differed. Local council-based participants from greenfield areas, outer suburban area locations or low-density areas with alternative forms of open space, were concerned about the future of population density and/or dwelling type in relation to new park decision-making environments yet were less concerned with how to meet current open space standards. Local council-based participants from

brownfield, inner suburban ring and middle suburban ring high-density areas were also concerned about the future of population density and/or dwelling type in relation to decisions about the adequacy of current open space provision. In some highly densified areas this was already beyond or nearing the limits of recommended open space standards. Local council-based participants from brownfield areas were further concerned with how to provide adequate open space for infill development targets set by state government and the predicted population growth as a result. This was because state government-based and local council-based participants in brownfield areas were already experiencing a shortfall of land availability for open space provision comparative to greenfield areas.

There was consensus among participants that increasing densification, particularly along transport corridors, and in major precincts and urban hubs intricately linked with transport-oriented development was a challenge if the continued expansion of parks were to keep pace with population growth. This applied especially to surrounding immovable infrastructure such as railway lines and major roads and where land was unavailable and could not be released through local council planning schemes or compulsory purchases. Delphi participants in particular expressed concern about access to, connectedness with and the variety of open space, especially when considering how park provision could fit into broader networks of public space, and specifically in areas earmarked for infill development and other infrastructure build-up.

Participants across both the Delphi study and the semi-structured interviews asserted that park provision must be considered more valuable than it currently is and as an infrastructure asset rather than as secondary to existing assets. Delphi and semi-structured interview participants alike thought this would enable park provision to be taken more seriously and be given higher priority. It would also encourage greater innovation in public space design to align with modern practices that go beyond traditional park provision as isolated pockets of open space linked with surrounding population ratios. Participants stated that while park provision could and should be considered as part of transport-oriented development and transport corridors, it was not integrated into the broader context of public benefit and the transport-oriented built environment package. This is because park provision is linked with notions of liveability, access and a more connected network of greenspace

function, which, according to participants, meant dwelling density should be related to the priority given to the provision of new parks. Participants felt transport-oriented development was too heavily focused on transport alone, rather than creating greater liveability through nearby amenity, including parks, such that the very concept undermined its own ideals of compact convenience.

Some participants expressed concern that transport-oriented development would lead to lesser likelihood of adequate open space provision, thinking that parks would be abandoned in favour of more profitable amenities, such as retail or car parking. Other participants hoped that transport-oriented development would deliver on providing adequate open space provision for the immediate surrounds. As participants explained, the denser the housing (for example, the proportion of four-or-more-storey apartment buildings nearby), the greater the priority that should be given to providing new parks. How that could be achieved in brownfield areas surrounded by existing infrastructure was a growing concern for local councils, particularly in relation to NSW state government intimations of high growth whereby amenity would be required to service bigger populations in established areas.

According to a majority of local council-based Delphi participants, population density in immediate surrounds was considered important in brownfield areas where there was a modicum of land that, in theory at least, could be considered for park provision. Population density dropped in importance in brownfield areas where there were no further land area sites for development or redevelopment. According to local council-based participants in brownfield areas with no further potential land for park provision, or limited land for new smaller parks, the only viable choice was to make the most of existing amenity. Hence the tendency for local councils to invest more in upgrading facilities in existing parks, rather than provide new parks.

> Everybody wants more open space and better-quality open space. Presently we are focused on ensuring that the quality of our open space is extremely high. This is through new facilities (playgrounds, gardens, etc.) and other things like upgrades to our aquatic centre (Delphi participant, personal communication, 12 August 2022).

According to local council participants from greenfield areas, although population density in greenfield areas was seen as less important, or at the most,

somewhat important, depending on context, in pockets of built-up areas, population density was becoming a growing concern. However, when scaled out to an entire LGA, this issue was not as concerning as for brownfield areas. In one case, much to the dismay of the participant, this was of such little current concern to the local council that it was selling off greenfield sites to raise revenue. This was because they felt they had too much of it, even with future forecasting and scenario-building models in place (semi-structured interview participant, personal communication, 23 August 2022).

Population density emerged as slightly more significant than dwelling type among Delphi participants when planning for park provision, with open space standards used as a vehicle for park provision based on various planning strategy documents. Open space standards, such as those administered by the NSW Government Architect and used by local councils in their annual reporting obligations to the NSW Office of Local Government for their key performance indicator data were reported as being commonly used by participants as they were tied with locational and political priorities, reporting frameworks, funding mechanisms and responses to legislative requirements. This is not to say that deviations from traditional standardised approaches to park provision did not occur, as evidenced by participant responses to park innovation and considerations, or other means of alternative open space provision, as discussed throughout the chapter.

Population density in relation to new park provision was considered important by the majority of participants across both the Delphi and semi-structured interviews. When population was categorised by sub-groupings, such as families with children, people with disabilities or people over 65, the density of these sub-groups became less important, as evidenced by the lower response rate to this line of questioning in the Delphi round one survey. According to the Delphi participants who did respond to this line of enquiry, however, where population sub-groups were considered, families and people with disabilities were considered slightly more important than other sub-groups. Age distribution was of little importance. Given that parks are considered and allocated as a public benefit primarily for children, it was unsurprising that families were considered slightly more important than other sub-groupings. One explanation for people with disabilities also considered slightly more important than other populations was a 4-year funding initiative administered to NSW local councils by the

NSW state government to specifically improve the accessibility of playspaces for people with disabilities.

Household structure was of little importance compared to other factors. Tenure type was not important. Income distribution was also a less important driver of park needs than other characteristics. Lower-income areas were considered slightly more important than middle or higher-income brackets. According to the responses from the pilot and round one Delphi survey, population density as a whole was of greater concern than a particular sub-grouping, unless a specific funding initiative was offered by state government to service a particular sub-group and local councils were able to take advantage of that initiative. The specifics of population characteristics did not emerge in the semi-structured interviews as they did not present as a main theme in the Delphi study and so were not followed up. What emerged across the Delphi and semi-structured interviews, however, was that access to open space in relation to a catchment area was more important to participants than population characteristics, as was dwelling density, as these two factors were crucial for meeting open space standards.

6.6.2 Shared open spaces

Shared open spaces emerged as a sub theme of open space standards, land availability and park innovation. They are located here as they most strongly relate to alleviating the current pressures on traditional open space standards and are the simplest at least in theory to implement.

Open spaces that were shared between state government entities and local councils or possible public/private partnerships were brought up as a solution to the scarcity of open space in brownfield areas. Participants agreed that if shared open space were to become the norm, agreements between entities would have to be in place regarding how, when and by whom spaces could be used, and for what purposes. In short, there were multiple logistical considerations for shared space programs, as follows:

1. Participants thought that clear service-level agreements would have to be in place.
2. Participants mentioned the issue of maintenance costs (shared or user-pays), insisting this would have to be clear from the outset. Two participants

expressed concern that owing to pre-existing power dynamics and legislative imbalances, local councils would likely end up with the burden of maintenance costs if collaborative arrangements were entered into between local council and state government organisations.

3. Participants recommended that clear legal responsibilities would have to be in place regarding responsibilities and liabilities before any collaborative shared-space arrangement could be agreed upon or implemented.
4. Participants proposed a hierarchy of organisational use dependent on land ownership. Permission would be required for shared-space arrangements to work.
5. Shared-space arrangements would require multi-tiered government collaboration and clear policy outcomes to be in place.

Several participants were in favour of shared-use arrangements with the NSW Department of Education as a means of increasing the open space footprint across local councils. Upon further enquiry, joint use arrangements, which are a specific type of shared-use arrangement designed to share the costs and administration of indoor and outdoor school facilities with government entities under a shared community and educational use scheme, in practice were not viewed by other participants as viable. Local councils were reluctant to take on the financial burdens of such a collaborative partnership owing to what were considered the necessary but complex arrangements of such an agreement[33].

Several participants were sceptical as to how shared-space arrangements between state government entities and local councils could be achieved, particularly when discussing the shared-space program currently being trialled by the NSW Department of Education across Sydney. As one participant noted:

> This would be difficult to extend into the long-term, given the various multi-protocol mechanisms for staff coverage that exists in various organisations. For example, this would require all maintenance staff from council to have a Working with Children Check if they were to empty the bins on school grounds, and that just is not going to happen. (Semi-structured interview participant, personal communication, 16 August 2022).

One reason for local councils being wary of shared-space bureaucracy could stem from the historical long-standing tensions between state and local government. This was not expressed explicitly as a reason for local council resistance to such arrangements, but some participants were concerned local council would be put under a greater financial and resourcing burden as a result. Several Delphi participants were in favour of the opportunity for shared-space programs, but no further insight was offered on the topic beyond it being a potential solution to local council challenges in providing new parks for the community.

6.7 Policy priorities and objectives

Policy priorities and objectives were the fifth theme to emerge from the research. Engagement with metropolitan, district and local planning priorities emerged as having less influence on park provision than the more pragmatic considerations of funding mechanisms and land availability. Nevertheless, all local councils engaged with metropolitan, district and local planning priorities to varying degrees and that engagement did have a bearing on new park provision. Frequently, metropolitan, district and local planning priorities were considered when applying for funding and were used to meet reporting obligations. Engagement levels varied among local councils as to how effective they thought the statements of metropolitan, district and local planning priorities were in achieving open space outcomes. State government for the most part, however, took a different view and identified metropolitan and district planning priorities as an important form of ensuring quality open space outcomes across state government and local council jurisdictions.

When considering what bearing local or jurisdictional political priorities had on decisions about the location, type and size of new park provision, responses were mixed, nor were they valued as highly as the practical considerations of land availability and funding mechanisms. Half the participants thought local/jurisdictional political priorities were somewhat important, a minority of participants thought they were very important, and two participants thought they were unimportant. Local and jurisdictional political priorities were seen to be more relevant to local councils than to state government entities. Further enquiry into the one state government-based participant response revealed that the participant considered that response in the broader context of previous jurisdictional responsibilities and experiences rather than

through the lens of their current role. Nonetheless, from a state government entity participant perspective, they viewed metropolitan, district and local planning priorities as very important (Delphi participant, personal communication, 18 May 2022). Overall, the responses indicate that participants saw local/jurisdictional political priorities on new park provision as less relevant and less important than funding, land availability, community expectation and engagement, or open space standards and their associated influences such as population or urban density considerations.

State and local strategic plans and environmental planning priorities were found to be the primary drivers behind planning for park provision, and these were backed by capital works programs. They were also guided by open space standards. Other considerations in implementing priorities were based on industry feasibility and public benefit scenario models, which frequently relied on future forecasting using projected population and anticipated dwelling density types a generation ahead. More immediate influences were guided by community demand and feedback mechanisms that often resulted in the reconsideration of park provision, depending on funding allocation, land availability and, to a lesser extent (and irrelevant to this research), conservation management plans.

The use of strategy documents was found to be the dominant means of planning for park provision across jurisdictions. As noted previously, different jurisdictions engaged with these documents to varying degrees and with varying success, and some participants found them more relevant to their needs and more helpful in gaining funding than did others. Several local councils engaged with metropolitan and/or district planning strategy documents when necessary and only to obtain funding, while others followed them far more closely, aligning their local planning documents with metropolitan/regional plans. As one Delphi participant explained: “These are followed where required by legislation and are generally engaged with reasonably closely, which is helpful in attracting grant funding for the delivery of projects” (Delphi participant).

Other participants admitted that their local council could improve their level of engagement, and a few were taking steps to remedy this.

Although state and district priorities were seen as ineffective as a planning tool beyond meeting planning legislative standard instrument documentation

requirements, this research revealed that local councils generally adhered to them in a planning context. However, participants in both the Delphi and semi-structured interviews saw them as irrelevant and unaffected by the reality of resource allocation at a local level, did not align with community feedback and did not account for existing local character, typological constraints, or existing urban amenity in their respective areas. For example, some participants intimated a sense of powerlessness regarding park provision outcomes owing to policy constraints and inadequate resourcing therein. As one participant explained: “At a state level, there is lots of discussion regarding the *Green Grid* etc. However, it is hard to actually turn this into on-the-ground delivery” (Delphi Participant).

As noted above, the provision of a more robust set of open space policy infrastructure was touched upon by some participants as an interventionist perspective in relation to practical considerations of funding supply and land availability. Participants posited that further guidance from the NSW state government regarding open space allocation mechanisms would be helpful in navigating the inherent tensions of conflicting land-use priorities and competition, open space standards and developer demands. In other words, greater enforceable prescriptive measures would provide local council with the tools they needed to ensure better open space outcomes within the funding and land availability constraints available.

When considering how parks are planned for, participants identified several factors, as follows:

1. While parks are partly planned with state environmental planning instruments, local environmental planning instruments and strategy documents are more relevant.
2. Community demand was cited as a principal factor when planning for park provision.
3. Park provision is linked to capital works programs, maintenance budgets and asset renewal requirements. Several participants noted development contributions are something to be mindful of when planning for park provision.

4. Lastly, and particularly for brownfield areas, projected dwelling and population density considerations heavily influence park provision.

Integrated planning and reporting frameworks were not explicitly mentioned as having an influence on park provision but, as with legislative requirements, they were inferred through the mention of capital works and state environmental planning instruments and strategies. From a state government-based participant perspective, participants reported that industry feasibility scenarios were an added consideration for the planning of park provision, and this had to be balanced against public benefit.

6.8 Park innovation

Park innovation was the sixth theme to emerge from the research. Local council resistance to park innovation and design attributes emerged as an influence on new park provision. Results were mixed regarding the uptake of non-traditional parks, such as rooftop parks, parklets or smart parks. In some cases, they were viewed as a necessity, due to a lack of traditional twentieth century park options with which to meet increasing city/environmental sustainability considerations such as the urban heat-island effect or to keep up with current or looming population growth. In other cases, local councils were more comfortable providing other forms of open space such as active recreation areas, than they were with park innovation and design attributes. These were usually local councils with a modicum of potential or available open space sites at their disposal.

Consensus was reached regarding the provision of park innovation by participants across the Delphi and semi-structured interviews; these being parklets, rooftop parks or parks that may or may not include some sort of smart technology such as water-sensitive design etc. Participants believed park innovation were a viable alternative to traditional twentieth century notions of park provision in their jurisdictions. However, results were mixed as to their current capacity for implementation across jurisdictions, with some participants having already implemented one or more forms of park innovation and others not.

Those participants who had not yet implemented a form of park innovation saw their viability as questionable, and with implementation or uptake problems. Some participants revealed they had received pushback from politicians, small businesses

or local resident groups regarding park innovations or implementation and they gave four broad reasons for that resistance:

1. A lack of information regarding park innovation.
2. Questionable park innovation financial viability.
3. Lack of community demand for park innovation.
4. Concerns regarding community access or uptake of park innovation.

Park innovation provision met with resistance that was either political, community or economically driven in nature.

Against that, participants who had implemented variations of park innovation were happy with the initial outcome. There were participants who, having already implemented park innovations or were in the planning stages of doing so, saw them as the only viable option for the future. Timing and expense factors were brought up as having considerable influence on the uptake of park innovations. As one participant explained, “Parklet intervention was relatively easy but expensive – acquiring a mobile parklet cost approx. [sic] $50k…” (Delphi participant).

A state government-based participant who provided an example of a rooftop park was optimistic about its function and application, explaining:

> In the case of the rooftop park, you create opportunities for park space in the B4 (development zone) rather than being constrained to RE1 (recreational zoned areas). This encourages a blend between the recreational space and the buildings themselves, particularly when the rooftop space is offered close to ground level (Delphi participant).

Another participant expressed similar enthusiasm for park innovation implementation: “Rooftop open space is always supported but there is a tendency for developers to default to the NSW Government’s *Apartment Design Guide* communal space standard rather than exceed guideline requirements, so uptake is limited” (Delphi participant)[34].

Based on their own experiences of political and community responses to park innovations, using less land and with reduced budgets, the majority of participants agreed a change in political and community attitudes toward such innovations would benefit everyone. For example, several participants stated there needed to be a change in political attitudes toward park innovation implementation. One participant

cited political resistance to park innovation and implementation as a barrier to their provision:

> Councillors fear making tough decisions that council staff who are professionals in this area know it is the way to provide good community spaces. This is because they are scared of losing votes. Elected officials should trust their staff as we are here to achieve the best outcomes for the community (Delphi participant).

Another participant believed politicians could be influenced by community attitudes toward park innovation, design and implementation, but it was a difficult cycle to break:

> Elected officials are generally unconvinced of the merits that above-ground park space can offer. This can be a case of chicken and the egg, as the association of merit with ground-level public space is based on historic reasoning. As the community realises and adapts to more innovative ways to achieve that space, the benefits and merits will increase and subsequently so will the views of the elected officials (Delphi participant).

In relation to lack of land availability for new open space, parklets were considered in some instances as viable, but only on a temporary basis, while high-street dining and high-street greenery were considered more viable, as car parking spaces would not be affected. As noted above, parking spaces were seen as more valuable, not necessarily by research participants themselves, but by the community or organisations where they were employed. Pop-up parks were seen as a quick and easy, viable option, especially on natural land already earmarked for development. As one participant explained:

> One example is a pop-up park on vacant land that council owns in the city centre. Just had to get the agreement from the council's property section to utilise the space as a pop-up park. This was relatively easy as it is temporary until the land gets redeveloped. The difficulty will be when the site is closed to the public and its use as a pop-up park is not permitted anymore. I think the users will be disappointed (Delphi participant).

6.9 Summary of Delphi study and semi-structured interview findings

The chapter has provided an in-depth account of the findings from the Delphi and semi-structured interviews. Results were combined as part of the thematic analysis methodology that underpins this research with the following conclusions drawn.

The findings of this research indicate that planners are all too aware of the barriers and enablers to park provision. However, more importantly, they have a great deal of insight into many of the solutions to the barriers and enablers to open space provision. Although, due to a lack of any real power in a system that favours market drivers and neoliberal planning ideals, planners are limited in what they can achieve. When considering the practicalities of the decision environments surrounding open space provision, participants make the best of the situation and always attempt to provide the best possible open space outcomes for the community.

Funding and land availability emerged consistently as strong underpinnings of the barriers, enablers, solutions, and other decision-making considerations for park provision. Thus, they are deemed to be the most significant themes to emerge from the research. The remaining factors include community expectation and engagement, population density and dwelling type, are linked with open space standards, and policy priorities and objectives. Park innovation was met with a degree of reluctance when placed in the broader context of barriers and enablers to park provision. It therefore became the least significant factor. The same barriers and enablers to park provision emerged time and again across each theme, thereby highlighting the complexities of interplay between influences and drivers that either enhance or hinder open space provision.

The importance of funding availability and land availability manifested differently between brownfield and greenfield areas. In brownfield areas, availability of funding, coupled with a lack of available land, fed into one another as a compounding issue. Greenfield areas, although concerned about availability of funding, were not as constrained by land availability. Further, greenfield areas could take advantage of the comparative flexibility offered by the available land which, in turn, eased some of the

funding constraints, compared to those experienced by brownfield areas. Funding was also less of a concern in several greenfield areas that had enjoyed additional state and federal government support through a specific collaborative multi-level government agreement (the Western Sydney Deal). The obvious reliance on voluntary planning agreements as a factor that dictated the literal allotment of land, which in turn could determine a park outcome, was described as inhibiting park provision, as were state government grants, not only because they were inadequate for park provision but also if in-kind contributions were required.

Community expectation and engagement were viewed as essential to the provision of high-quality open space by participants with community engagement being taken very seriously within the decision process. However, participants indicated that a tension emerged regarding the management of community expectation against local council capacity to deliver on those expectations within the constraints of regulatory and literal urban infrastructure contexts. Participants agreed that if the community were provided with greater education and awareness of the constraints faced when decision makers considered the provision of open space, this would prove beneficial to open space outcomes. However, details of what this community education could look like were not forthcoming.

Building upon the themes of funding availability and land availability as barriers to park provision, a further theme to emerge throughout the research was the relevance of open space standards. Coupled with population density and land availability/costs, especially in brownfield areas, participants stated current open space standards were impossible to meet. Participants agreed open space standards lacked functional relevance to the reality of park provision from a local council perspective. Participants wanted to see a more flexible and functional place-based approach to park provision that went beyond the standards so that they would fit more neatly with local council priorities and constraints. Currently, participants did not indicate place-based approaches or precinct activation were meeting community needs. This highlights the disconnect between the strategic tools required by local council and the capacity of local councils to provide high-quality open space outcomes.

Marginally less significant was the influence of metropolitan/district/local strategic plan priorities, with local strategic planning priorities shown to be slightly more important than metropolitan/district strategic plan priorities.

Park innovation is a relatively new addition to the evolution of open space provision. Therefore, it is hardly surprising it emerged as the least significant factor in relation to the barriers and facilitators of park provision within the immediacy and pragmatism of these research findings. Although, participants agreed that park innovation would be the most likely solution to the current and projected shortfalls for open space provision. However, regardless of the potential benefits provided by park innovation that included shared space arrangements, participants expressed concerns regarding the availability of implementation mechanisms including legislative and jurisdictional responsibility. Furthermore, where park innovations had occurred, they appeared to be either as a one-off pilot project, frequently temporary in nature, or only implemented when all other options for more familiar forms of open space provision had been exhausted. However, where these had occurred, participants were enthusiastic about their outcomes. The findings also showed a level of uncertainty expressed by participants with mixed views regarding community expectation and other stakeholder acceptance of such innovations. Therefore, at the time of data collection (2022), park innovation was not the most popular option. It is predicted this may change as options for land allocation decrease, community and stakeholder expectations adjust accordingly, open space standards become more flexible, policy infrastructure and legislative frameworks catch up accordingly, and funding mechanisms follow suit.

These findings along with those from Chapters 4 and 5 are further discussed within the context of the broader literature in Chapter 7.

Chapter 7: Discussion

7.1 Introduction

This research explores local authority decision-making environments facilitating the provision of a key element of liveable and healthy cities: parks. The chapter is divided into four sections. The first section briefly recaps the justification for the research as to position the focus for the remainder of the chapter. This includes the research questions and subsequent six themes and key elements to emerge from the work, and the role each play in the fundamental story of this research. The second section positions the results of the research by theme into the literature; mirroring the layout of the "Findings" from Chapter 6. This is to say, themes are ordered in level of importance as deemed by the thematic analysis of planner responses regarding open space provision. The third section provides the results, recommendations and implications of the research questions, and further situates them into the broader literature. The fourth section provides a summary of the chapter.

Chapter 1 established the foundational reasoning behind this research, including why exploring the topic of open space provision matters. It explained why Sydney was chosen as the case study area and further explained why the voices of planners needed to be amplified over other stakeholder perspectives. The literature review provided an in-depth examination of open space provision as it is currently understood within the academic literature. This is of relevance, as the current chapter explores the interplay between existing findings and those established by this research. As described in Section 3.3 "Study design", there were three data components to this research; two secondary and one primary, which make up the three findings chapters of this thesis. Findings included an outline of the regulatory context supporting open space provision in Sydney and a brief analysis of the funding mechanisms therein. Along with current land percentage availability, and current and future analysis of urban density and land use for open space provision in a densifying environment. Lastly, it included planners' opinions on the constraints and enablers of open space provision – all of which are now brought together and discussed within the current chapter.

Parks provide enormous urban and public benefits to society (Konijnendijk et al., 2013; Sadeghian & Vardanyan, 2013), yet increasingly, as cities densify, greenspace is lost to other hard infrastructure and amenity such as roads and housing (Balikçi et al., 2022; Haaland & van Den Bosch, 2015; Lin et al., 2015). Understanding the policy and decision-making environments and processes that lead to park provision is important because, as urbanisation accelerates, traditional twentieth century means of park provision will not be scalable or functional and other open space alternatives will prove increasingly essential (J. Byrne & Sipe, 2010; Veal & Piracha, 2022). Furthermore, community values, usage and expectation of park provision and amenity are changing (Boulton et al., 2022; Bush & Doyon, 2017; Naserisafavi et al., 2022; Schech et al., 2022). Understanding how supply mechanisms of park provision and other open space can meet city-dweller requirements and expectations and fit within an ever-increasing competitive environment for land zone usage and funding/resource allocation in the future requires greater understanding to ensure Sydney (or any city) remains liveable into the future (Boulton et al., 2019; Corkery & Marshall, 2018; Lowe et al., 2020). In short, the findings of this case study contribute to an increased practical and theoretical understanding of these topics, both applicable to Sydney and elsewhere as cities evolve and urban densification becomes the norm.

The first research question asked: “What are the crucial elements needed for new park provision and how does perception (and availability) of these differ among state and local-level policy-making entities and amongst individuals working with those entities?”

The second research question asked, “Do some localities experience sharper deficits, and if so, what can be done to address local disadvantage? How would park provision strategies need to be revised?”

The third and final research question asked: “How could deficits be overcome? What strategies have state and local entities developed to increase park provision? Is there any consensus about the effectiveness of strategies, among policy actors at different levels?”

7.2 Situating the research

The primary focus of this research was to examine how state and local government make decisions about establishing new parks. Secondary data was used as a framing tool to triangulate the findings from the Delphi study and semi-structured interviews. Six main themes emerged from the primary data collection, from which six key elements of park provision are further realised.

As explained periodically throughout this thesis, the six themes and six key elements for open space provision are categorised under the same groupings: 1) funding; 2) land availability; 3) community expectation and engagement; 4) open space standards; 5) policy priorities and objectives; 6) park innovation. Also as explained previously within this research, the six key elements required for open space provision differ in their role in the research compared to the six themes which emerged from the Delphi study and semi structured interviews.

The six themes that emerged from this research reflect the decision-making environments in which planners are placed, for example, in which state government entity or local council they are employed, and what remit and resources are at their disposal. This extends to include individual organisational priorities, or in the case of state governed entities, scope, and in the case of local councils, the varying jurisdictional characteristics such as brownfield or greenfield area allocation. The six themes emerged based on what information participating planners in this case study were willing to share within the scope of the research questions throughout the primary data collection process. This is why they are frequently referred to as the results of the research.

The six key elements essential for new park provision are independent of the decision-making environment in which they are situated. Put simply, the six crucial elements for park provision are not reliant on participating planners' opinions or confined to the body of this research but are seen as essential requirements for open space provision that are applicable beyond the direct thematic findings of this research. These six elements are applicable to rapidly densifying urban developments around the world. This is why they are frequently referred to as the recommendations of this research.

The close proximity between the six themes and elements identified in this research speak to the relevance of this research beyond the local scale. The study deepens our practical understanding of decision making about open space in Sydney, but it also contributes to the deeper theoretical debates that form the context of this pragmatic story. These debates focus on the effectiveness (or ineffectiveness) of urban governance institutions and practices, and the importance of democratic engagement to effective governance, to urban and public health outcomes, to city sustainability, and to societal values. How cities and city-dwellers value open space can be seen as symptomatic of how these broader issues or urban liveability are addressed. This is why it is so important to examine open space from planner's perspectives, as they are uniquely situated at the intersection of policy, politics, community and open space delivery.

The six themes and the key elements are each simultaneously barriers and enablers to new local park provision. While they can be separated out and evaluated as different dimensions of the same problem (how to provide open spaces that work on multiple levels to improve urban environments) they are inseparable in practice. Without land, increasing funding for parks may be futile. Without community engagement, policy making may be an empty endeavour.

As noted previously, this research was divided into primary and secondary data elements. Primary data gathered the opinions of 17 planners representing state and local government with administrative and implementation responsibility for park provision across Sydney using a pilot test and two-round Delphi study, and separate semi-structured interviews (Chapter 6). Beyond engagement with key literature as detailed throughout this thesis, secondary data analysis took a two-pronged approach. The first involved undertaking policy analysis and an examination of funding allocation for open space provision via developer contributions and state government grants (Chapter 4). The second involved analysing current and future urban density and land use for open space provision across Sydney between 2022 and 2041 (Chapter 5).

The six themes for new park provision identified from this research are summarised in order of level of importance as prioritised from planner responses below, before being further thematically placed within the context of the academic literature throughout the chapter.

1. The most significant theme was the lack of available funding for new park provision.
2. A lack of available land in brownfield areas, compounded by the exorbitant cost of land across Sydney, emerged as the second-most significant theme.
3. Community demand was influential but was both a barrier and an enabler to park provision.
4. Open space standards were identified as increasingly impossible to meet given the challenges facing local councils regarding land availability in brownfield areas and the increasing pressure by NSW state government to meet broader infill targets.
5. Policy priorities and objectives were seen as somewhat valuable in facilitating funding uptake, but in practice they were difficult for some jurisdictions to implement owing to funding, land and jurisdictional constraints.
6. Park innovation was met with a level of resistance by some local councils, yet in other jurisdictions, they were either an enabler or, increasingly, the only remaining option for adequate open space provision.

7.3 Six themes/key elements

7.3.1 Funding availability

A lack of available funding emerged as the most significant and pervasive theme affecting new park provision as identified by planners in this research. As noted previously, funding was tied to almost all aspects of park provision, regardless of jurisdiction, and emerged as do all themes/elements as both an inhibitor and facilitator to delivery mechanisms and broader planning outcomes. This is not an uncommon finding, as experienced across the world. Gaining adequate funding for park provision is a struggle when pitted against urban growth agendas and other city-shaping priorities (Haaland & van Den Bosch, 2015), be it domestically (Boulton & Dedekorkut-Howes, 2024; Bush, 2020; J. Byrne et al., 2010; Searle, 2011), or internationally, such as Hong Kong (Chan et al., 2015), the UK (Crowe, 2018; Nam &

Dempsey, 2020; A. Smith et al., 2023) or the USA (Barrett et al., 2017; Joassart-Marcelli, 2010; Pincetl, 2003; Rigolon et al., 2018).

One of the biggest barriers to park provision is how their status as a non-market good is thus quantified in order to gain funding in line with other more easily quantifiable infrastructures such as roads, cycleways, footpaths or housing (T. Baker & Ruming, 2015; McConnell & Walls, 2005; Tempesta, 2015). As noted throughout this thesis, increasingly in New South Wales there is a push to elevate open space and other urban greening initiatives and green infrastructure within the confines of a traditional cost-benefit analysis, so as to be higher up the list of infrastructure priorities (for instance, through the release of the *Framework for valuing green infrastructure and public spaces* (DPE NSW, 2023).

When considering funding for new parks in the form of developer contributions, made either as a capped payment, or voluntary planning agreements (VPAs) or as land in kind, these too emerged as both an inhibitor and facilitator to new open space. This is not unexpected, given the legislated direct link between developers and quite often, particularly through voluntary planning agreements, the supply of new park provision, particularly in precinct developments, master-planned estates, or area reactivations where they were heavily relied upon. Additionally, precinct development is seen by planners within the constraints of the current regulatory context of the NSW planning system and state government growth agendas as the most effective means of quality new park provision across Sydney. Which on the surface appears as a positive for the state government neoliberal planning ideals, until one notes the caveat by planners that declare developer contributions are inadequate for the task.

The inadequacy of developer contributions for open space provision both in Sydney and elsewhere around the world is a long-standing issue noted across the literature (Altshuler & Gomez-Ibanez, 2000; Boulton et al., 2018; J. Byrne et al., 2010; Merk et al., 2012; Searle, 2009, 2011). What these findings indicate, particularly in relation to precinct development by the state government (DPHI NSW, 2024n), is a further dependence on the private market for a public good, which in relation to the already low priority of park provision when measured against other more direct forms of profitable infrastructure and city-shaping outputs, is a concern

(Boulton & Dedekorkut-Howes, 2024; Bush, 2017; Coffey et al., 2020; Corkery & Marshall, 2018; Evans & Freestone, 2011).

As illustrated by the analysis of funding as a resource allocation, potential or otherwise for new parks (see Section 4.5 “Funding for open space” and Section 4.6 “State government grants”), developer contributions markedly vary across jurisdictions, as does the successful uptake of the various NSW government-funded initiatives by local councils. As discussed below, the reasons for these are varied, and again unsurprisingly so, given the roles of local councils are to service the needs of their respective and often diverse local communities (LG NSW, 2023).

According to the findings of this research, and those across the literature, the questions of how to plan for and implement appropriate open space provision strategically and operationally and how or who funds this amenity are constantly being weighed up against other resourcing issues (Boulton & Dedekorkut-Howes, 2024; Boulton et al., 2018, 2021; Bush, 2020). Findings of this research also indicate, the fairness and enforceability of the funding mechanisms that resource open space provision, particularly in relation to developer contributions, is a source of tension between local councils and developers. This is a long-standing finding across the literature, which does not appear to be resolving as densification increases: more funds are needed for open space provision. Findings of this research further indicate, there is also tension felt by local councils regarding the state government funding and resourcing processes, as these are not always seen as adequate or appropriately needs-based by local councils to serve their communities.

Local councils across Sydney experience different barriers and enablers to park provision depending on several factors, including financial health of the local council, staffing, land availability, dwelling density, community preference for open space, competing amenity within the LGA, such as health or manufacturing precincts, other infrastructure priorities such as roads, footpaths and housing, land zone patterns and the literal size of the jurisdiction. In other words, Sydney is diverse and, although the NSW planning system has measures in place to accommodate such diversity, they are not always effective, particularly where open space is concerned. The precarious position of local councils in relation to revenue raising, resourcing and open space provision is long-standing (Comrie, 2013; Dollery et al., 2006; Grant & Drew, 2017;

LGPA (Local Government Professionals Australia), 2020; Productivity Commission, 2008; SGS Economics and Planning, 2022).

When considering alternatives to traditional developer contributions, the response by planners was cautious. Private/public partnership parks were seen as a possibility beyond the traditional developer contribution model, even though the latter was the most popular and currently preferred model. Developer contributions were also preferred over other models of public/private partnerships based on familiarity with the system. It is surmised therefore, that the perceived mutual benefit between public and private investment, for example, voluntary planning agreements (VPAs), which provide a higher hedonic value for developer sales and in turn increase council rates and public benefit through new park provision, were the most easily recognised means of valuing the provision of open space by developers, which is why planners likely found it useful when negotiating with developers. However, further information on this topic was not forthcoming in this research.

Public/private partnerships in relation to open space provision, although prevalent overseas (Joassart-Marcelli, 2010; Perkins, 2010; A. Smith, 2021), are comparatively new in Australia. This is not to say they were not being considered by a few planners in this research as an enabler to public space activation. As to what this entailed or how the different models of public/private partnerships were interpreted by planners within this research was not forthcoming.

There is a third model of investment emerging for park provision that involves philanthropic organisations (K. Davidson & Gleeson, 2018; Walls, 2014), but it did not emerge as a possibility in this research. This indicates that either planners are unaware of it, or it is not yet considered relevant or applicable in a local council setting. Findings of this research indicate planners want further funding options for parks across their jurisdictions that extend beyond the bounds of state government grants or developer contributions. However, other research posits that private funding/resourcing for open space provision may not be the best way forward, particularly in relation to mitigating perceived uneven power dynamics between local council and state government entities as this may well be the simple swapping out of one dynamic for another that does not give local council any more agency and if anything may only serve to reduce the quality of open space outcomes as a result. For example, several international research studies have found that privatisation, or

shared governance arrangements, have fewer effective outcomes than government-driven funding arrangements (Gabriel, 2016; Perkins, 2010). It is feasible that public/private partnerships will become a further means of park funding in Australia in the future, but as to what that could look like was outside the scope of this research.

7.3.2 Land availability

A lack of land emerged as the second most significant and pervasive theme effecting new park provision as identified by planners in this research, particularly in brownfield areas. As noted previously, lack of available land for open space provision is a pressing concern the world over, particularly where urban densification is occurring (Beer et al., 2003; Boulton et al., 2018; J. Byrne & Sipe, 2010; Haaland & van Den Bosch, 2015). Planners felt they had limited options that would provide adequate open space within a planning system focused on urban growth rather than increased regulation.

For example, transit-oriented development was a growing concern among planners, particularly in relation to its tendency to exclude open space provision. A finding also noted in the literature (Bolleter & Ramalho, 2019; Cervero & Sullivan, 2011; Mukhamedjanov et al., 2021). Troy et al. (2015) question how transport orientated development is likely to work in Sydney, particularly in middle ring suburbs where large legacy infrastructures are immoveable such as roads and rail lines, and there is so much existing dwelling stock in the form of flats nearing their end-of-life span. This in turn leads to questions regarding open space provision, which when examined through analysis of current and future urban density and land use for Sydney (see Section 5.5.1 “Population standard”) indicates a decline in open space provision compounded by dwelling demand and population growth. Bolleter & Ramalho (2019) put forth a greenspace orientated development approach as a complement to the transport orientated approach as a means of creating sustainable, liveable and more productive means of urban growth and amenity for diverse populations moving forward. There is a strong argument to be made for placing green space orientated development above transport orientated development, particularly when considering the benefits local parks provide (Ellis & Schwartz, 2016; Konijnendijk et al., 2013; Sadeghian & Vardanyan, 2013). However, this is an unlikely scenario given the lack of direct economic benefit provided by open space in comparison to transport or other city infrastructure (Tempesta, 2015).

When considering land availability in relation to greenfield areas, findings from this research indicate land availability in greenfield areas was not as much of a concern to planners when considering open space in new urban developments – at least not for quite some time. However, when considering larger versus smaller local park provision, several divergences emerged: 1) between vertical tiers of government, owing to different capital and operational mechanisms for park provision as outlined above; 2) between theoretical experiences of planning by local council planners and actual greenfield and brownfield areas. This is to say, that although planners found planning for larger parks easier in theory, in practice they were more difficult to implement owing to prohibitive costs, even if land were available, such as in greenfield areas, and practically impossible to deliver where land is not – In brownfield areas; 3) between theory and practice, as community expectation and the capacity for local councils to deliver collide. For example, a Perth based study by Giles-Corti et al. (2005), the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016) and the *Greater Sydney outdoors study* (DPE NSW, 2019), all find the community would prefer larger parks with greater mixed amenity and functions than smaller parks closer to home. However, as to how this can be achieved, even with the state government funding initiative *Parks for People* focused on larger parks (DPHI NSW, 2024L), is difficult to foresee in the current climate of urban growth and infill development.

7.3.3 Community expectation and engagement

Community expectation and engagement emerged as the third most significant theme effecting new park provision as identified by planners in this research. The prevalence of community expectation and engagement as an integral part of open space provision is not unexpected, given the hierarchy of NSW planning instruments (DPHI NSW, 2024r) and the requirements of the *Local Council Integrated and Reporting Framework* (OLG NSW, 2021b, 2021c) (see Section 4.2 “Strategic planning”). However, the matter of managing community expectation and engagement was not a straightforward process. Similar to other research (Boulton et al., 2021), planners were caught between the tensions of community want and local council capacity to deliver new open space to meet city-dweller requirement. Furthermore, there were not adequate mechanisms, for example, effective communication channels in place to negate these tensions. Similar to other research,

planners found that the way they were able to engage with the community was narrow in focus and did not allow for meaningful dialogue or outcomes outside of normal feedback and complaint practices (Aulich, 2009).

This tension experienced in relation to community engagement mechanisms for local council in part can be explained through a governance lens. For example, research has found that local councils often take a conservative approach when using social media as a communication tool with their community (Heaselgrave & Simmons, 2016; Osborne et al., 2021; Sharif et al., 2016), whereby there is a disconnect between the risk appetite of the organisation and the expectation of the community as to how, where and when the community are willing to engage.

Although not an explicit theme to emerge from this research, the concept of community co-design for open space provision is emerging throughout the research as a means of creating more meaningful and fit-for-purpose planning outcomes. For example, Lin, Thompson et al. (2023) found in their study examining various stakeholder perspectives on park quality, size and management, that community co-design seemed to be a positive way of engaging the community while alleviating the traditional tensions that can arise between community wants and local council capacity to deliver. Similarly, Naserisafavi et al. (2022) found in their case study examining nature-based solutions in an open space that it was important to get to know the community to serve their needs more fully. Lastly, George (2022) noted that in relation to urban green infrastructure (particularly green corridors and walking trails), community-led governance was quite successful.

This research found that in the outer suburban and middle suburban rings of Sydney, community demand was frequently more focused on active rather than the traditional passive recreation spaces, such as the parks favoured (or provided) in the inner suburban ring. Thematically, planners tended to express concern over how more active space could be achieved in brownfield areas owing to land supply constraints. This finding was previously echoed by Burgin et al. (2014) in their Sydney case study regarding the oversubscription of sports fields in inner suburban ring local councils due to an increase in community demand.

One solution to the demand for more active open space by the community was proffered by Cranney et al. (2019) who found in an audit of outdoor gyms in Sydney

that the installation of outdoor exercise amenities was a good way to revitalise parks. However, they found that while the installation of outdoor exercise equipment had increased over the five years previous, community consultation on their installation was limited, as were the promotional strategies used to inform the community that the amenity existed. The lack of effective community engagement or communication strategies harks back to the frustration experienced by planners in this research over inadequate communication channels with which to engage the community and which, if they were in place, could simultaneously lessen the weight of stakeholder priorities and yield better open space outcomes.

7.3.4 Open space standards

Open space standards emerged as the fourth most significant theme affecting new park provision as identified by planners in this research. There is a great deal of research devoted to the various aspects of open space standards and whether or not they are an appropriate means of measurement or whether they have outgrown their original purpose of a minimal service offering of open space provision, and how should they be approached moving forward (Turner, 1992; Veal, 2013, 2020). As noted throughout this thesis, there are calls across the research for more sophisticated approaches to open space standards, measurement and understanding to the functionality of daily living (Byrne et al., 2010; Corley et al., 2018; Moseley et al., 2013; Veal, 2020; S. Wang et al., 2021). Similarly, the findings of this research indicate that planners would like to see greater functionality and sophistication afforded to the measurement of open space provision in order that it properly reflected city-dweller uses rather than actual typology as is the current overarching trend within framework documents and reporting mechanisms.

The *2022 NSW Common Planning Assumption Projections for year ending 30 June* (DPIE NSW, 2020) illustrates the intended urban growth patterning for Sydney over the medium term. These indicators in turn influence how local councils respond to new open space provision, particularly over the shorter term. Bunker (2012) observes when considering population forecasting as a feature of Australian metropolitan planning, that setting population forecasting a generation ahead is questionable as it locks a strategy into distributing infrastructure and amenity on an unpredictable indicator which becomes less stable the further ahead the forecast. Bunker (2012) continues, that to then distribute the population across the

metropolitan area and create targets based on said distribution is not an efficient or effective means of city planning because the inevitable inaccuracies create weaknesses in the city shaping discourse.

However, there is a strong argument to be made that if planning is not set at least a generation ahead, then what chance does Sydney have in ensuring it remains serviceable to city-dwellers now and into the future? Therefore, surely a flawed logic is better than no logic. As noted previously, findings from this research indicate that open space provision in already highly developed areas of Sydney is currently inadequate to meet city-dweller requirements based on traditional population ratio standards and is only set to get worse in the medium term if the state government population projections are accurate (DPIE NSW, 2020).

As flawed as population ratio standards may be considered (Veal, 2020; Veal & Piracha, 2022) in certain situations, as noted previously, to not have them would be catastrophic, because if the market were left to its own devices, open space provision would likely be swallowed up by more pressing city-shaping priorities that yielded more direct returns on their investment such as housing, roads and other hard infrastructures.

The quantifiable data of land percentage ratio standards dedicated to open space and population ratio standards applied to Sydney as a case study may not explain the entirety of the decision-making environments that planners have to contend when considering new open space provision, but they do portray a future scenario of diminishing open space provision based on current accepted measurements and practices if the priority and metrics of open space do not change. In turn, this speaks to broader issues of city-shaping discourse, public and urban health ramifications, liveability, sustainability and further climate inequity. Therefore, the value of analysing current and future urban density and land use for open space provision should not be under-estimated as a means of highlighting current thinking and practice, particularly when coupled with qualitative data as was the case in this research. It further validates not only the experiences by planners relating to future open space provision concerns but serves as a powerful reminder of actual open space outcomes.

7.3.5 Policy priorities and objectives

Policy priorities and objectives emerged as the penultimate theme effecting new park provision as identified by planners in this research. As discussed previously and in more detail throughout this chapter, translating policy into practice is seen as problematic through the literature (Alizadeh et al., 2022; Barnett & Beasley, 2015; Bengston et al., 2004; Boulton et al., 2018, 2021; Bunker & Holloway, 2007; Searle, 2011; Wilson & Hughes, 2011). However, despite its short-comings, findings of this research also indicate that policy is essential for new park provision. Just as the use of population ratio standards and land area percentages for open space provision, policies hold a counterweight to market drivers and offer practical and regulatory guidance as to the provision of new open space. These findings are not dissimilar to P. Burton (2017) who states that, in essence, planning is a form of state intervention designed to produce better environments and urban landscapes than urban development that is subject only to market forces and individual litigation or transaction. Therefore, although findings of this research indicate that planners at times found policy priorities and objectives to be unrealistic, irrelevant and inconvenient, they also recognised that without them, there would be even greater inconsistencies regarding open space provision across the urban environment if indeed it were considered at all. Therefore, as with previous research, these findings indicate that policies were both a barrier and an enabler to open space provision (Boulton et al., 2018; Bush, 2020; Farahani & Maller, 2018; Fingland, 2015; Raynor et al., 2018).

7.3.6 Park innovation

Park innovation was the least pervasive theme to emerge as affecting new park provision as identified by planners in this research. This is not an unexpected finding when placed in the broader context of spatial land patterning as identified by the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016). Sydney as a case study experiences an abundance of open space, therefore park innovation on a broad scale does not seem as necessary when there is so much bushland nearby. However, not all of it is usable for daily rest or relaxation. Therefore, it is only when drilling down into smaller scales of open space provision such as on an LGA level or smaller, that the need for park innovation truly becomes apparent. As noted throughout this thesis, Sydney experiences a diversity of urban form, both brownfield

and greenfield. Although land availability for traditional twentieth-century notions of park provision is diminishing in some areas, and community expectations are shifting, owing to spillover effects between jurisdictions whereby city-dwellers are able to access nearby amenity in a neighbouring LGA, for example, without a great deal of effort, park innovation has not become an absolute necessity and to a large degree remains a novelty.

Findings from this research indicate that parklets were considered in some instances as viable, but only on a temporary basis. This is contrary to international examples, whereby parklets are growing in popularity and formal recognition for their value add to community life and micro-urban greening capacities (Birdsall, 2013; Campisi et al., 2022; Kamvasinou, 2024). This is likely to be explained by the relatively higher population densities experienced in cities around the world as compared to Australia, whereas noted previously, there is a large array of open space (Y. Hsu et al., 2022). Therefore, with land for traditional twentieth century notions of park provision to meet city-dweller requirements exhausted, parklets become a much more appealing option beyond being a novelty concept or act of rebellion or commentary on the urbanisation of cities and subsequent loss of nature as they originated (Birdsall, 2013).

According to the findings of this research, rooftop parks were the most cited park innovation to emerge by planners beyond a high-street activation, yet as to their viability as extensions of open space was questioned by some planners and met with enthusiasm by others. Research finds that rooftop parks are an effective form of extending the footprint of open space across a wider city network (Tan & Samsudin, 2017), yet this does not automatically correlate with community access (Bolleter et al., 2024; Li and Du, 2024; Yuen & Hien, 2007). To date, the majority of research in Australia relating to green roofs has focused on ecological and sustainability benefits. This is not an unexpected finding given that rooftop parks are relatively new in Australia as compared to elsewhere around the world (Irga et al., 2017; Williams, Bathgate et al., 2021; Williams, Rayner & Rayner, 2010) and to date, rooftop parks as they are considered by this research are not as popularised as other forms of urban greening.

Popup parks were seen as a quick and easy, viable option, especially on natural land already earmarked for development. When considering the legality of

public space across various jurisdictions including Sydney, Flynn and Thorpe (2021) assert that the concept of pop-up urbanism, such as parklets and green dining that came into fashion at the height of the pandemic, and from which city-dwellers gained much joy when social distancing was in full force, are a potential catalyst for positive urban change, yet they are vulnerable to exploitation in relation to profitability being put before the public benefit. A similar sentiment was noted by Schaller and Guinand (2018) who found that pop-up urbanism is also vulnerable to infrastructure being rushed through without due diligence, exampled in their examination of pop-up parks in Philadelphia, linking them to potentially driving up nearby real estate prices owing to their capacity to reinvigorate an area. Mata et al. (2019) are more optimistic and claim that pop-up parks bring enormous social, health and ecological benefits and should be considered more seriously as an alternative or addition to the suite of urban greening initiatives and programs available to decision-makers. Stevens, Leorke, Thai et al. (2024) agree that pop-up urban greening initiatives have enormous benefits for the community, therefore, to make them permanent if they proved successful in initial phases was not only possible, but preferrable. However, as to what that could look like would be different for each place-based outcome in terms of timing and orchestration.

The subject of smart park design in the traditional sense, that is, using technology or other smart internet-based innovations did not arise. As briefly mentioned previously, what emerges thematically in the Australia-based literature when considering smart urbanism is that it is in its infancy, is fragmented and project-specific (Dowling et al., 2019; Downton et al., 2016). This may go some way to explaining why smart parks did not emerge during this research, as they are not yet a prominent enough feature in daily practice (Corkery & Marshall, 2018; Nitoslawski et al., 2019), nor potentially did planners see them as relevant compared to the more pressing issues of funding and land availability. One planner mentioned that a water-sensitive design was being embedded into new park provision in their jurisdiction as a matter of course, dependent on cost and resource allocation. This decision was made based on an increased urgency to address climate change, the urban heat effect and anticipated urban growth in the area where traditional park provision resources without such features were too costly to maintain and out of step with community expectation. Coutts et al. (2013) stated that incorporating water-sensitive

design elements with vegetation, if done well, can greatly ameliorate the urban heat island effect and the effects of climate change in an area. Floyd et al. (2014) argued that turning Sydney into a water-sensitive city is complex, costly and requires a whole-of-government approach coupled with private sector and community support to be achieved. As noted previously, there are increasingly more NSW state government policies being administered that relate to smart places including the *Smart places strategy* (DPIE NSW, n.d.), the *NSW Government's Smart Infrastructure Policy* (DSC NSW, 2020) and the *NSW Smart Public Spaces Guide* (TFNSW, 2023), yet as illustrated elsewhere throughout this thesis in relation to open space provision, there are challenges in relation to translating policy into practice. Therefore, it stands to reason that the transition to smart places and smart parks are likely to face the same hurdles as more traditional open space provision such as siloing, resourcing, funding and community demand. As to how these complications manifest may differ, given that there are complexities with smart park design related to technology, data protection and a potential wariness by the community of such changes that do not exist within traditional park provision accountabilities.

7.4 Discussion of research questions

As noted periodically throughout this thesis, including at the top of this chapter, three research questions guided this study. The following provide a response summary to each research question in turn. The results of this research as discussed below are a familiar refrain across the broader literature. This indicates the research questions themselves are an important line of enquiry applicable beyond the immediacy of this case study and are relevant to other jurisdictions in similar situations to Sydney.

7.4.1 Discussion of research question 1

The first research question related to the crucial elements needed for new park provision and whether the perception (and availability) of these differ among state and local-level policy-making entities and amongst individuals working with those entities.

The six key elements listed above are frequently found as known challenges and recommendations throughout policy documentation as previously noted in direct

correlation with this research such as *Greener Places* (GA NSW, 2020) and the *Public open space strategy for NSW* (DPE NSW, 2022), and elsewhere in Australia (Arundel et al., 2017; Boulton et al., 2018; Bush, 2020; Silk, 2020), the UK (Wilson & Hughes, 2011), the USA (Bengston et al., 2004) and Europe (Davies & Lafortezza, 2017).

These six elements or aspects therein are further repeatedly noted throughout the findings of broader scholarship in relation to the effectiveness and outcomes of open space provision or the lack thereof (Colding et al., 2020; Kabisch, 2015; Park, 2023). This indicates that the findings from this case study are not uncommon. This therefore speaks to a deeper theoretical debate regarding how society values open space when measured against other city-shaping priorities and the rigidity of the governance systems therein. These include linkages with urban and human health (Shanahan et al., 2015; Thompson & Kent, 2014); climate adaptation; sustainability; and biodiversity (Bush et al., 2015; Davern et al., 2017; Potter, 2019; L. Taylor et al., 2022; Vieira et al., 2018; Zivanovic & Luck, 2016).

When considering the perspectives from which state government entities or local councils view the capacity for new park provision from within this research, different priorities are given to the six key elements as listed above. NSW state-level entities often emphasise regulatory and funding mechanisms, while Sydney based local councils focus on the practical challenges of land acquisition and community needs as reflected predominantly throughout the relevant and applicable policy accountabilities for each tier of government.

The Delphi study revealed that state government entities tended to prioritise strategic planning and funding allocation, whereas local councils were more concerned with immediate implementation issues, such as ongoing maintenance, land availability, community demands and the requirements to meet open space standards. These differences and tensions between priorities in relation to open space provision are well documented throughout the academic literature from the perspectives of state government (Fingland, 2015) and local council (Comrie, 2013; Dollery et al., 2006).

The discord between organisation responsibilities highlights the need for a more integrated approach to open space provision, one that considers both strategic and

operational perspectives to ensure that park provision is effective. This is similar to other Australian-based research that also calls for more integrated approaches across government to ensure better open space provision outcomes (Boulton et al., 2018; Bush, 2020; Bush & Hes, 2018; Lin et al., 2015).

Another challenge facing the implementation of the six key elements for open space provision is found in the formation of boundaries, both literal and figurative, of the government entities themselves. As the participants confirmed, the siloing of open space provision is a product of both jurisdictional geographic boundaries and a planning system that does not encourage a more collaborative approach despite all its claims to the contrary (Boulton et al., 2021; Bush, 2020; Fingland, 2015). For example, the findings of this research indicate that local councils did not necessarily seek to collaborate over open space provision. If anything, such provision was more likely to be an incidental exercise in fulfilling metropolitan-wide objectives for creating greater connectivity and diversity of greenspace across Sydney, as described in the *Sydney Green Grid* (DPHI NSW, 2024s), such as a green corridor or a one-off regional park project. This is despite the well-documented benefits of and calls for increased open space connectivity (Anguluri & Narayanan, 2017; J. Byrne et al., 2010; Corkery & Marshall, 2018; Haaland & van Den Bosch, 2015; Lin et al., 2015).

However, this is not an unexpected finding given the traditional nature of jurisdictional responsibilities being clearly defined for local councils. Given the state government push toward precinct development (DPHI NSW, 2024n), it is anticipated that local councils will be increasingly expected to work together to increase open space outcomes. As to how the resource allocation for these initiatives will be managed on a more pragmatic level by councils themselves, let alone whether precinct development open space provision will meet community need, was (at the time of data collection - 2022) yet to be seen or elaborated on by planners. Once again, the lack of collaboration between local councils regarding the boundary specific (siloed) approach to open space provision is not unique to Sydney, with scholars noting similar results in Victoria (Bush, 2020; Torabi et al., 2020). Furthermore, similar problems regarding the fragmented approach to open space provision across jurisdictions have also been long reported more broadly across the internationally based literature (Bengston et al., 2004; Colding et al., 2020; Kabisch, 2015; Mell et al., 2017; Park, 2023).

7.4.2 Discussion of research question 2

The second research question related to whether different localities experience sharper park provision deficits, what in turn can be done to address local disadvantage, and how should open space strategies be revised to address the shortfall.

The research regarding shortfalls of open space provision as a result of densification is well documented around the world and has long been noted as a point of contention within the literature (Beer et al., 2003; Boulton et al., 2018; J. Byrne & Sipe, 2010; Haaland & van Den Bosch, 2015). The more cities densify, the less land there is for open space provision, nevertheless the more open space provision is required to meet the needs of growing populations. Furthermore, the greater the urban density, the greater the burden placed on parks to help manage air purification, noise pollution, vulnerable plant and animal habitats, storm water run-off, urban heat mitigation, urban aesthetics and other services essential to healthy urban environments and city-dwellers (Fuller & Gaston, 2009; Hansen et al., 2019). When considering open space provision in a compact city, Hansen et al. (2019) argue that multi-functionality, cross-departmental collaboration and place-based characteristics are the most important considerations on a city-wide scale, where land is at a premium and open space is expected to carry the burden of a densifying human habitat with increasingly less land supply and resourcing. This study finds a similar strong concern over shrinking land supply, further compounded by expected population growth, particularly in brownfield areas where land is already at a premium. Concerns about the increasing burden on the capacity for local councils to provide enough open space arose repeatedly.

The entanglement of land scarcity along with other resourcing issues as found in this research is reiterated in the international literature. Colding et al. (2020) identifies the loss of open space by several key characteristics. These include budgetary constraints experienced by local councils for open space provision and upkeep, which results in a separation of attributes, that can create siloed and fragmented approaches to long-term spatial planning outcomes that compound the gradual loss and degradation of greenspace experienced across cities. They continue by explaining that the greatest challenge facing open space provision is the micro decline born from people's experiences of said space. This is to say, changes

in open space provision occur incrementally, that results in baseline shifts, where each generation of humans tends to take the current condition of an ecosystem (or greenspace provision) as the norm, and disregard its previous condition.

The shrinking land supply in Sydney in relation to park provision has not passed without notice across the literature (J. Byrne & Sipe, 2010; Chae et al., 2014; Haaland & van Den Bosch, 2015). As the findings of this research illustrate, the availability of land was a challenge in brownfield areas, but less so in greenfield areas, where more land was available for new park provision. This is in line with other Sydney-based research (Y. Hsu et al., 2022; Lin et al., 2015). However, once again this is not a challenge experienced by Sydney alone, as other cities around the world have also noted the differences in potential for open space provision in greenfield areas (Barbosa et al., 2007; Bengston et al., 2004; Browning & Rigolon, 2018; Chapin, 2012; Wilson & Hughes, 2011).

Furthermore, this research also found through current and future data analysis of urban density and land use for open space provision based on common population ratio standards calculations, that land availability for park provision would be unable to meet future city-dweller needs. As noted throughout the chapter, the inability of cities to provide adequate open space in the future is a topic that repeatedly emerges throughout the literature. However, where Sydney does differ in comparison to the USA for example, is that there is less of a correlation between park provision deficits and race or income. Therefore, this places Sydney at an advantage in comparison to (some) other cities.

Targeted interventions, such as increased state funding, land acquisition policies and community-driven park initiatives, are essential to address these land deficits effectively (Boulton et al., 2018; Frantzeskaki et al., 2022; C. Thompson, 2002; Veal, 2020; Whitten, 2019). Other important factors are policies that will enable better place-based outcomes, a more functional approach to traditional open space standards and reporting mechanisms, and a more meaningfully collaborative approach. These recommendations are in line with GA NSW (2020) but a much better resourced effort is needed considering how little land (5%) is actually designated for recreational open space across Greater Sydney, as found by this research in assessing the data from the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016).

In this study, planners indicated that beyond more support from the state government, they'd like to see more sophistication regarding how open space is measured for recreation purposes. This is not dissimilar to other literature (Fuller & Gaston, 2009; Hansen et al., 2019; Veal, 2020; Veal & Piracha, 2022), which acknowledges the need for a more demand-based approach to open space and park innovation, particularly in rapidly densifying environments.

This want for greater nuance regarding how open space provision is viewed from a policy perspective is obviously something the state government is aware of, because as periodically noted throughout this thesis, there are indications of open space definitions evolving, as evidenced by the recategorization of open space from passive and active open space, to open space for recreation, between the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016) and *Greener Places* (GA NSW, 2020). More prescriptive best case study examples for open space and park innovation add to this nuance. However, there is still a reliance on reporting and monitoring as well as measuring access catchment standards, land area standards, and population standards through sources such as the Office of Local Government *Time series data 2020-2021* (OLG NSW, 2024b), the *Greater Sydney public open space audit* (DPE NSW & GSC, 2016), and *Greener Places* (GA NSW, 2020) and rightfully so according to the findings of this research.

As this research indicates, although population ratio standards are impossible to meet in some local government areas (LGAs), standards nonetheless are essential as a tool for open space provision, for without them, planners would have no quantifiable scaffolding to fall back on when negotiating with developers for the public good. As scholars have also noted, there is an equally valid argument that notes the implicit reliance on access catchment standards and population ratios can at best be a basis for needs-based modelling and at worst a tokenistic yardstick to encourage open space as a means of meeting a planning agreement or policy target without considering quality or function (Boulton et al., 2018; Feltynowski et al., 2018; Veal, 2020; Veal & Piracha, 2018, 2022).

7.4.3 Discussion of research question 3

The third research question related to the potential for overcoming park provision deficits and the perceived effectiveness of strategies developed by state

and local entities at differing levels and by various policy actors for new open space provision as a result.

As indicated above, one of the biggest challenges facing the implementation of the six key elements as identified by this research on a strategic (top-down city-shaping) level is how policy infrastructure is translated into practice. Planners reported a disconnect between policy and realistic avenues of park implementation, particularly in relation to scalability of priorities. There is a thematic trend across the literature pointing to policies being largely ineffective in relation to actual delivery of open space provision not only in Australia (Alizadeh et al., 2022; Boulton et al., 2018, 2021; Bunker & Holloway, 2007; Searle, 2011) but elsewhere (Barnett & Beasley, 2015; Bengston et al., 2004; Wilson & Hughes, 2011). Specific explanations vary across the literature depending on the approach taken to the research. Raynor et al. (2018) found in their Brisbane base study that the tension between policy and implementation was difficult to resolve owing to the competing influences between planner, politician and developer wants.

Boulton et al. (2021) found as a result of their interviews with local council-based planners in Southeast Queensland, that translating policy theory into practice was problematic because strategic planning approaches are separate from the pragmatic requirements of supplying said amenity. Therefore, state-initiated policy infrastructure is frequently misaligned with local council settings. Lowe et al. (2020) found in their Australia-wide study of state-based policy that lack of consistent terminology for open space, along with differing targets and interpretations of their success, created confusion for measuring actual open space implementation. Villanueva et al. (2015) posit that different metrics were required to form policy if better open space outcomes were to be achieved.

The awareness by government entities of the six key elements for open space provision does not appear enough to ensure new local park provision. Boulton et al. (2021) discuss the different priorities – both soft social internal organisation priorities and hard tangible deliverables. They find the personal and literal landscapes are fraught with difficulties in managing urban park provision on a local level. The research regarding how best to manage urban park provision in terms of responsibility and implementation follows a similar thematic vein of confusion, contradiction and stakeholder tensions (Boulton et al., 2018; Bush et al., 2020; Bush

& Hes, 2018; J. Byrne et al., 2010; Plant et al., 2017). As noted throughout this thesis, and the findings of this research, the under resourcing of government entities and necessary yet tangled layers of authority in relation to the responsibilities of open space provision are seen as both a barrier and enabler to park provision (Boulton et al., 2018, 2021; Chan et al., 2015; Dempsey & Nam, 2024; Haaland & van Den Bosch, 2015; Rigolon et al., 2018).

Shared space arrangements are seen as one possible solution to the shortage of open space provision, particularly in brownfield areas (Bohnert et al., 2022; M. Burton & Mathers, 2014; J. Byrne & Sipe, 2010; Dessì, 2020). Contrary to previous research, this research found shared-space programs and park innovation were perceived as more problematic than new park provision, unless all other avenues for traditional twentieth-century forms of park provision had been exhausted. Planners expressed concern from a local council perspective regarding the governance and operational arrangements required with other government entities to create a successful shared-space outcome. In line with other recent research, this research finds that shared-use arrangements between government organisations are not without challenges, owing to the inherent complexities of jurisdictional responsibility, and transforming what is traditionally seen as space designated for education into a more community-oriented space will take time and a significant shift in public attitude and policy (Cilliers et al., 2024).

Similarly, park innovation was also met with a degree of resistance by some planners in this research. However, where it was occurring it was considered more on a project-by-project basis rather than as an element within wider strategies. This is in line with previous Australian based research that finds smart park design and implementation is fragmented in its implementation (Dowling et al., 2019). This is unsurprising, given that park innovation is comparatively new as compared to traditional park provision that extends back to the pleasure gardens of the British Victorian era (Cranz & Boland, 2004). Increasingly, NSW state government are rolling out policies and guidelines to support the advent of smart cities and places including the *Smart places strategy* (DPIE NSW, n.d.) the *NSW Smart Public Spaces Guide* (TFNSW, 2023) and the *NSW Government's Smart Infrastructure Policy* (DCS NSW, 2020). As noted elsewhere throughout this thesis, smart park design and park innovation are only set to increase as cities densify, climate change becomes more

prevalent, and society more broadly becomes increasingly dependent on technology. The raft of policies set forth by the state government signals the intent and tacit expectation that smart technologies will be delivered as a matter of course in relation to open space and will become the norm. However, as to how effective their implementation is on a broad scale to improving the equity of parks is yet to be realised.

In short, the disconnect between urban planning theory, policy and implementation outcomes currently appears insurmountable. Therefore, city-dwellers can but hope there are enough small urban greening initiatives driven by tactical or pop-up urbanism, good urban greening policy with the resources to back them up, and new innovations and individual projects that together form greener equity across cities as a result.

7.5 Summary of discussion

The chapter has situated the findings from this case study and discussed them within the broader literature. It has explained the findings both in relation to each of the three individual research questions, and as identified by each of the six themes in order of importance as identified by planners within this research. Furthermore, the linkages between the themes as identified by planners and the six key elements essential for new open space provision were explained and contextualised within the literature.

As noted previously, research regarding open space is gaining momentum among scholars, government entities, and other stakeholders. Regardless of the methodological approach or lens through which the topic is examined, more needs to be done to understand the value in which the way decision makers or those in power and the current systems of provision function regarding the evaluation and subsequent delivery of open space. This research provides both a practical and theoretical understanding to the barriers and enablers shaping local park provision in a rapidly densifying environment.

This research contributes to the growing literature calling for more place-based outcomes and innovations-based approach founded on human-centric benefits to improving park provision. Recommendations include: 1) increased funding and

funding avenues for open space provision as well as greater accountability measures as to the quality of open space provision; 2) increased land allocation for appropriately connected and fit for purpose open space to meet current and future community need; 3) greater education for communities regarding the constraints surrounding open space provision as well as a more flexible and meaningful approach to community engagement; 4) a more flexible approach to open space standards, including the types of open space measurement and associated calculations that are more in line with modern urban environments and densification; 5) more adaptable policy priorities with greater prescriptive elements for planners and value an increasingly broad spectrum of open space provision; 6) increased support for park innovation and smart design, to ensure open space provision continues to be relevant to ever evolving city-scapes, community expectation and climate adaptation.

The results of this case study mirror many of the findings found elsewhere around the world. There is an argument to be made that this is reassuring, as this case study serves to further highlight existing disparities in open space provision from which valuable lessons can be learned, and a further evidence base can be built to leverage for better open space outcomes. However, the findings of this research, when placed within the broader literature, also speak to a chronic undervaluing of open space across different variants of urban governance mechanisms. This is particularly concerning when considering the enormous public benefit parks provide and the rapid densification of city/regions around the world.

Chapter 8 provides a series of recommendations for open space provision, along with potential future avenues for research. It also provides a summary on how this case study contributes to the wider body of knowledge, along with the impact this research hopes to achieve.

Chapter 8: Conclusion

8.1 Overview

Due to the expansion and diversification of density, Sydney, like many urban centres around the world, is facing challenges relating to climate change, population growth, housing density and future housing demand, planning and sustainability. All of the above prompt discussion and questions regarding the treatment and effectiveness of urban greenspace (Burgin et al., 2016; Haaland & van Den Bosch, 2015; Lin, Meyers & Barnett, 2015; Lin, Meyers, Beaty & Barnett, 2016; Searle, 2009, 2011). The chapter synthesises the findings from the investigation into park provision within the context of Sydney's rapidly evolving urban landscape. By examining the interplay between funding, land availability, community expectation and engagement, open space standards, policy priorities and objectives, and park innovation, this research has underscored the complexities and interdependencies that influence effective park provision, not only in Sydney, but further afield as cities around the world urbanise and densify, and the population continues to grow. The impact of the COVID-19 pandemic further highlights the critical role of adaptable and resilient strategies in ensuring equitable access to green spaces. This chapter consolidates the key insights and implications derived from the case study, emphasising the importance of integrated approaches to urban planning to foster more sustainable and liveable urban environments.

8.2 Research questions examined

This study addressed three research questions:

1. What are the crucial elements needed for new park provision and how does perception (and availability) of these differ among state and local-level policy-making entities and among individuals working with those entities?
2. Do some localities experience sharper deficits and, if so, what can be done to address local disadvantage? How would park provision strategies need to be revised?

3. How could deficits be overcome? What strategies have state and local entities developed to increase park provision? Is there any consensus about the effectiveness of strategies among policy actors at different levels?

In response to Question 1: the findings of this research conclude there are six key elements essential for park provision. These are identified as follows: 1) funding; 2) land availability; 3) community expectations and engagement; 4) open space standards; 5) policy priorities and objectives; 6) park innovation. How these six key elements are responded to is dependent on context, with state government entities experiencing different challenges to open space provision compared to local councils. Experiences also differed across local councils that were dependant on brownfield or greenfield development and on socio-economic advantage/disadvantage of the LGA. Across all local councils directly involved with this case study, funding and land availability were inextricably linked as thematic findings from the Delphi study and semi-structured interviews and viewed as essential as two of the six key elements crucial to open space provision. Equally as important but with slightly less influence from a pragmatic standpoint were the themes and key elements of community expectation and engagement, open space standards, and policy priorities and objectives. Park innovation varied across jurisdictions but appeared to be embraced only when all other avenues for traditional twentieth century forms of open space provision had been exhausted or when specific funding were allocated to innovation by state government entities.

In response to Question 2: this research found that deficits in park provision are experienced differently across brownfield and greenfield areas in Sydney. Brownfield areas experience greater disadvantage in relation to land availability and the capacity to meet current open space standards as a result of densifying populations and increased competition for infrastructure in already established environments. With increasing infill targets set for already established Sydney-based LGAs, planners expressed concern about their ability to meet current open space standards. Several LGAs involved in the case study were already experiencing a deficit in open space provision compared to population ratio standards, owing to a lack of land in their jurisdictions. Greenfield areas experienced inadequacy in park provision on a more localised level as compared to a LGA wide scale, in relation to inadequate funding and community demand changing from notions of traditional twentieth century parks

to more active open spaces. Neither brownfield nor greenfield based local councils felt they were properly equipped to negotiate with developers in any meaningful way and precinct developments, often led by state government, were seen as the most likely means of ensuring adequate open space provision for future population growth.

In response to Question 3: the findings of this research conclude that park provision inadequacy could be overcome through a wide range of improvements. These include improvements in funding mechanisms and in adjusting land-use policies. They include the need to foster stronger community involvement via dynamic engagement processes for planners and the community alike and for a more sophisticated formal open space standards approach fit for 21st century urbanisation. They include a greater willingness by planners, local councils and NSW state government alike, along with other stakeholders in open space provision to implement open space innovations that incorporate transport and amenity connectivity and creativity that have been trialled, implemented and proven successful overseas. Lastly, they include a greater understanding and implementation of scalable priorities and frameworks across the whole of government as well as other potential stakeholder/decision-maker interests. In other words, good open space outcomes should be the result of more integration across resources, infrastructures, decision-making environments and organisations. Strategies that may support this include:

1. Better support for the enforcement and leverage of developer contributions and a more nuanced understanding of how and why NSW state grants are taken up or passed over by local councils.
2. Allowing local councils greater flexibility regarding revenue raising for park upkeep.
3. A more formal recognition in open space standards, reporting mechanisms and policies that not all land is fit for daily human use/function.
4. Support for innovative land-use approaches, such as rooftop parks, linear parks and shared spaces.

Policy actors agree on the importance of these strategies, yet their effectiveness varies by locality and other situational variables. The Delphi study and semi-structured interviews showed that while state government entities and local

councils agree on the essentiality of increased funding and innovative land use, the success of their implementation was haphazard. Sydney-based local councils in densely populated areas frequently experience more significant challenges, requiring specific place-based solutions to meet their unique needs. This underlines the need for flexible planning policy frameworks that are more adaptable to local conditions than is currently the case.

One could argue that other elements of the NSW state-local government relationship undermine NSW local government's ability to meet park needs. State caps on rates, land taxes and development contributions are significant constraints on local funding sources. If NSW local governments had more autonomy, they might have the funds to fulfil a higher proportion of the new demand generated by population growth or have (at least partial) control over that growth to ensure that essential infrastructure (such as parks) could be provided in step with community needs. This is an argument long put forth by local government advocacy bodies (Abelson, 2023; LGPA (Local Government Professionals Australia), 2020; Mangioni, 2015; Productivity Commission, 2008; SGS Economics and Planning, 2022).

8.3 Implications of this research for Sydney's urban planning

This thesis began by outlining the enormous urban and public benefits provided by parks. The research set out to understand the decision-making environment shaping future park provision in Sydney, New South Wales, Australia, drawing on a Delphi panel and in-depth interviews with planners from NSW state government and local councils. The research identified the strengths and weaknesses of the urban planning decision-making environment in Sydney. The findings indicate that key pressure points influencing park provision include the scarcity of suitable land in developed areas, and the challenges to ensuring development contributions meet the requirements for new park provision in line with expected dwelling density and population growth in the area.

The chapter brings the previous steps from the complete study to answer the main research questions, identify areas for future research and reflect on the strengths and limitations of the research. The insights arising from this research are

critical for Sydney's current (and future) growth agenda. If land is not made available for quality, functional and easily accessed new park provision, and park innovation does not happen, Sydney risks losing its reputation as a global, green and connected city (Acuto, 2012). Beyond Sydney's reputation, however, are deeper issues of liveability, sustainability and functionality of the urban environment for city-dweller wellbeing, biodiversity, and climate change that need to be addressed. High-density development requires urban amenities beyond roads, water and waste infrastructure. The research presented here raises significant questions about the adequacy of Sydney's public investment in park infrastructure. This in turn raises questions regarding urban and public health, broader government spending and priorities, policy inertia and other city-shaping, ecological responsibilities and other areas that are beyond the scope of this research, yet no less impacted by the value or lack of value placed on open space provision.

The understandings gained from this research are not only important for Sydney but offer valuable insight into likely challenges other cities are already experiencing or will experience as urban densification increases. Therefore, this research offers not only a cautionary tale regarding the over-reliance on private interest to fund a public good such as parks, it highlights the importance of an integrated policy framework that is relevant to practice-based outcomes in a multi-layered governance system where the competition for resources is intensifying, open space standards are no longer applicable in their current form, and community expectation regarding the amenity and provision of open space is changing.

8.4 Implications for state government entities and local councils

The research findings indicate that NSW state government entities and local council experienced the barriers and enablers to park provision differently. Funding, land availability, community expectation and engagement, and increasingly, park innovations (rooftop parks, parklets, linear parks, shared-space programs, smart parks and pop-up parks) are key elements essential for park provision by local councils. Equally so are the elements of open space standards as a minimum, and the importance of clear, prescriptive and integrated policy priorities and objectives to

ensure accountability across multiple tiers of government. However, the capacity to coordinate these resources and deliver successful parks across the Sydney Metropolitan Area is uneven. For example, while most local government-based participants identified funding and land shortages as barriers to local park provision, there were substantial differences in the scale of the deficit. Areas with dense and rapidly densifying populations had the greatest deficits of land availability. Funding was also a concern for most of these dense areas owing to the exorbitant cost of land.

However, there were two exceptions. The first exception was a particularly dense area with no land available for new park provision and with no zoning capacity for higher-density dwellings. This meant the local council could not capitalise on large developer contributions for neither revenue nor for new park provision. The second exception also had no land available for new park provision, but thanks to generous high-density growth, had substantial funding for new park provision through developer contributions, yet were tasked with focusing on high-street activation instead or upgrading existing parks as they were without land for new park provision.

For local councils in Sydney greenfield areas, land availability was not yet seen as problematic, but funding was still a concern. Changing community preferences for open space were also a concern for local councils. Some local councils reported difficulty in updating park facilities to reflect current community demand, with limited resources and competing demands in new residential locations.

Conversely, NSW state government entities, although concerned about land shortages and funding deficits, experienced those concerns differently, and seemingly to a lesser extent compared to local councils. Additionally, some NSW state government entities were more concerned about land provision than others. This can be explained horizontally by the various scopes and remittance responsibilities of different state government entities and how land provision and funding are allocated depending on the priority of an agency. State government differs from local councils in that in some instances it is responsible for setting planning priorities from the top down and providing recommendations for adequate open space standards, while local councils have the responsibility for implementing open space standards. Local councils were in principle concerned with achieving planning priorities and state expectations. However, when funding and/or land were

not available, these expectations were deferred indefinitely owing to a lack of alternative options that could be measured according to current open space standards.

Park space deficits were larger in LGAs with higher housing density and sustained or recent high rates of population growth. Thus, while taking community demand seriously, they could not necessarily respond as they and the community would like, given the large deficits in land and/or funding. In jurisdictions with more undeveloped land, land supply for parks was less of a concern compared to jurisdictions with higher population/dwelling densities where land was at a premium and competition for it was high. Similarly, a lack of available land for development also undermined the potential for development contributions to fund new parks. Park innovation thus became a higher priority in these jurisdictions, as they were the only remaining strategy with the potential to meet community needs and respond to NSW state-level planning priorities.

NSW state government entities were far more comfortable compared to local councils with funding mechanisms, land availability and local council ability to respond to community demand/engagement. NSW state government entities were far less likely as compared to local councils to report problems in attaining metropolitan planning priorities, or indeed most other barriers to open space or park provision. In NSW, state government entities are partially responsible for providing solutions to park shortfalls. They also define expectations (standards of provision), provide resources such as land, amenity or funding and allow local councils to assemble a workable set of solutions to meet demand for more parks.

What is clear regarding park provision across Sydney is that no one jurisdiction, NSW state government entity or local council is immune to the pressures of urbanisation on open space provision. Secondary data shows that if park provision is likely to be insufficient for the changing needs of an area, how soon and which of the crucial elements above will be the weakest link in relation to open space provision? The answer is highly dependent on the characteristics of an area. For example, percentage wise, the greatest population growth is projected to occur in the outer northwest and southwest suburbs of Sydney, and this will apply an as-yet-unseen greater pressure on open space requirements resulting from the need for new infrastructure and amenities to support the housing, commercial developments,

roads, footpaths and drainage to service new city-dwellers. Increased population density means an increase in the requirement for park provision and an increased burden on existing open space stock. It also means that while land supply will shrink, demand for open space will grow, and unless alternative strategies or safeguards are put in place for open space provision, Sydney's greenfield areas will find themselves in a similar predicament to brownfield areas: facing lack of land for open space provision to meet current and future population requirements.

Based on current funding and resourcing regimes and without the ability to tax and spend with more autonomy in relation to open space provision, local councils in Sydney greenfield areas are likely unprepared and not equipped to meet these challenges. What is required is greater flexibility and higher priority placed on open space provision allocation that goes beyond the heavy reliance on developer contributions and NSW state funding to something more adaptable for future needs. Population growth that will further increase population densities is also going to occur in the inner and middle suburban rings of Sydney, which will in turn compound the current strain on parks and the decision-making processes designed to ensure an adequate supply to meet that growth. Local councils in the inner and middle suburbs of Sydney are aware of these challenges yet have insufficient resources and power/negotiating capacity to ensure good open space provision outcomes for their communities. If systems for NSW local councils to provide open space do not change and growth agendas continue to override open space provision priorities, they are increasingly likely to fail to meet open space standards obligations. However, more worrying is how this potential lack of open space provision is likely to affect the quality of life for city-dwellers in those areas and what costs in terms of productivity or health will be incurred as a result.

8.5 Importance of funding for park provision

NSW local councils are highly reliant on NSW state government grants and developer contributions for new park funding. This is because their rates revenue is allocated to capital works such as local park upkeep. Developer contributions or voluntary planning agreements were seen by most participants as inadequate to meet requirements or expectation for park provision. The inadequacy of developer contributions was identified across multiple scenarios. These included comparisons

with how other infrastructure was funded or given higher priority than parks. One example is enabling park development at a slower pace than where it was needed, or worse, not enabling park provision where actually needed. Another example is enabling adequate park development but not of the quality/variety with the optional extras the community or local council demanded.

NSW state government grants were overall preferrable to developer contributions, which may be explained by the perceived reliability of funding compared to the changeable nature of voluntary planning agreements. This in turn might be explained by the fact that NSW local councils are poorly equipped to negotiate outcomes that benefit the public rather than private interest. However, more research is required to understand the reasoning behind this result. As stated previously, NSW state government is not as concerned with funding matters as it is bound to a separate set of funding mechanisms for open space provision.

8.6 The issue of land availability in park provision: brownfield vs greenfield

This research found that the difference between Sydney's brownfield and greenfield sites in terms of land availability for park provision had a significant impact not only on how local councils from brownfield and greenfield areas viewed potential challenges, particularly in relation to developer contribution negotiations, but also on how local councils from brownfield and greenfield areas approached park provision based on land availability. Local councils from Sydney's brownfield areas were acutely aware of the lack of land for traditional twentieth century notions of local park provision. Representatives from several of these councils stated they had already run out of land for new local park provision and were concentrating on high-street activation and other forms of park innovation as a result. Lack of land also meant that brownfield based local councils had little choice regarding nearby land uses or slope and vegetation compared to greenfield local councils. Sydney's greenfield local councils acknowledged that greater land availability enabled them to approach park provision with greater flexibility from the planning stages and beyond without the impediment of existing infrastructure or legacy projects. Where brownfield and greenfield local councils and the NSW state government tended to agree was that

the most efficient means of good-quality park provision was through large precinct development, because park provision was given as much weight as other new infrastructure. However, questions remain as to how functional and connected these new open spaces are in relation to daily city-dweller need and surrounding infrastructure such as active and public transport, let alone how they fit into the wider urban fabric and aims of increased greenspace connectivity.

Given the funding shortages for local park provision reported in this thesis and elsewhere in the literature, the well-documented fall in land availability and the increase in competition for infrastructure as a result of urbanisation, the question is not whether innovative park strategies can mitigate the shortfalls in local park provision experienced across Sydney, but how effectively such strategies can be implemented under current policy and practice.

The findings of this research show that to date there is more resistance to innovative park strategies and implementation in practice than in theory. This is owing to a range of factors, not the least being a lack of prescription, encouragement and resourcing for such innovations compared to more traditional twentieth century forms of park provision. While park innovation does occur, it is siloed in nature and considered only if and when all other forms of twentieth century traditional forms of park provision are exhausted.

Local council participants in this research appeared far more comfortable with high-street activations, active open space, and mixed-use precincts than with such park innovations as rooftop parks or parklets, unless as a one-off showcase project. For new park innovations to be more widely implemented, a more active approach needs to be taken. The idea that parks or park innovations are an optional extra as a city infrastructure needs to shift so that all stakeholders value parks and park innovation more highly. Given the changing nature of city dwelling, park innovation will happen and, as communities and decision-makers become more familiar with its application and implementation, greater innovation is likely to occur, the likes of which are as yet unimagined or unimplemented.

However, to simply wait for this to happen, or for novelty projects to become the norm, is not sustainable. Park innovation needs to occur more systematically and in a much more initiative-taking way. This means greater funding, land resourcing,

community engagement and revaluation and reclassification of open space standards to ensure park innovation is not only included but is actively encouraged and provided in public space planning. Policy and guideline documents need to be updated to reflect more opportunities and more case study practices of what park innovation looks like and how it can be implemented beyond what is already showcased in government documentation and urban planning circulars. Developers need to be better incentivised to provide park provision and park innovation in meaningful ways that provide better functional outcomes.

What this could look like was not forthcoming from the findings of this research. A greater public awareness of park innovation needs to be provided by government so that the community are not only involved in the potentiality of park innovations but are aware of the benefits they provide and can contribute to the creativity this opportunity provides.

8.6.1 Barriers and enablers for park provision

The policy documents listed in Table 12 and Table 13 indicate that all levels of government are aware of the barriers and enablers to new park provision. There are multiple guidelines and frameworks providing indicators, standards and design pathways/case studies for new park provision that go beyond twentieth century traditional park provision to encompass greater connectivity, more open space innovation and urban greening, mixed land use, scalable suggestions and measures extending from the smallest of project-based or place-based outcomes to large multi-area precinct developments. These are identified through the *Movement and Place Framework* (NSW Government, n.d.-a). Increasingly, policy documents across NSW state government entities are designed to work in conjunction and take less siloed approaches to open space provision.

8.7 Avenues for further research

There are three avenues for further research based on the findings of this research: 1) A repeatable or scalable version of a Delphi methodology used within this research and applied to other jurisdictions and/or different cohorts; 2) Using the methodology of secondary data analysis of current and future urban density and land uses for park provision at an LGA level, further research and scenario modelling is

required to understand the implications of the results more conclusively. For example, geographic data being aggregated to a smaller scale; 3) Further scrutiny of the following two topics:

1. Current and potential alternative funding mechanisms and avenues including land availability considerations for park provision and how resources can be improved to suit rapidly urbanising environments and increased competition for land allocation. This includes the current system contributions and how those contributions are enforced to ensure high-quality and adequate parks, an examination of NSW state government grants, how and why those are taken up or passed over by local councils and what, if anything, can be done to ensure good-quality open space in the future. This is in addition to alternatives to traditional local council revenue and open space provision mechanisms such as public/private partnerships, alternative allocations and measures of open space and viability of shared-space programs that go beyond those currently underway. This avenue could also include further analysis of population/ratio measures of park provision and alternative demand-based models based on liveability indicators or other measures that go beyond traditional interpretations of health or sustainability outcomes.
2. Further research is required into how community demand for park provision that goes beyond twentieth century traditional park amenity is changing to include more active space and a flexibility of activities performed in those spaces as well as the spaces themselves. For example, to include urban squares with green infrastructure that can be adapted for multiple activities such as night markets or a pop-up skatepark, or high-street activations that include urban greening features such as parklets and other innovative place-based approaches that suit the characteristics of any given area rather than a more generalised approach based on catchment-based access guidelines and open space standards. Other alternatives include rooftop parks and mixed-use precincts, and linear parks whereby traffic is cordoned off either temporarily or permanently to increase pedestrianisation and tree cover. This includes understanding the barriers and enablers to alternative open space provision, such as rooftop parks, parklets, smart park innovations and

infrastructures including indicators of liveability and climate change. Further, there is a need for greater understanding of how state and local government can equip the community with greater knowledge of open space provision beyond the current community engagement mechanisms to enable more collaborative and effective outcomes for all stakeholders.

When considering how this research and the methodologies therein can be repeatable and scalable across other jurisdictions or situations in relation to cities experiencing greenspace provision challenges, the following three recommendations are made based on local, domestic and international considerations:

1. To counter the self-selection bias in this research, further research could concentrate specifically on local greenfield councils in Sydney and the barriers and enablers to new park provision they are facing as part of the Western Sydney City Deal, including the unprecedented population growth and infrastructure investments in that area. This research provides valuable learnings and experiences from brownfield areas (as well as opinion from greenfield areas) that can be applied to greenfield areas, including the documented challenges that planners in local councils face regarding park provision in densified areas. Specifically, it demonstrates the importance of identifying and protecting future park sites as an essential public/urban benefit, particularly if there could be some resistance to park provision innovation.
2. The methodology used in this research can be replicated, scaled, or adapted to fit other situations, such as a nationwide survey of experienced planners from relevant federal, territory and state government entities and local councils or experts in local government financing.
3. The methodology could also be expanded to include planners from the private sector to see if opinions differ from those revealed in this study. Combining perspectives from both public and private sectors would give a more in-depth understanding of the challenges, expectations and experiences from an industry-based urban planner perspective. Alternatively, the methodology and the findings could be used to inform a larger comparative study of park provision decision-making processes,

between metropolitan and regional local council across New South Wales, between capital city metropolitan areas across Australia, or scaled to an international level across countries with similar bureaucratic mechanisms to Australia, to examine and better understand the role of different sectors and levels of government in providing social infrastructure to manage the effects of population growth and densification.

Finally, in relation to future research directions resulting from this research, there were several themes that emerged from the results of this research that go beyond a methodological replicability. These include the topic of smart park technology implementation, community expectation, and future viability of public/private partnership for open space provision funding. From a secondary data analysis perspective in relation to the mapping of open space based on open space measurement standards, there is a benefit in applying a more sophisticated and smaller scaled approach to examining open space provision scenarios across Sydney.

8.8 Contributions to the literature

On a practical level, this research addressed a gap in the literature by providing a metropolitan case study of the structural, policy and funding mechanisms guiding park provision across Sydney. It extended the literature on policy, structural and funding institutions in metropolitan brownfield-versus-greenfield areas and at state-versus-local levels in a rapidly densifying city. These findings contribute to the literature by providing further evidence of the importance of park provision, not only from a specifically geographic context (Sydney being a city with a complex set of metropolitan and geographic challenges and characteristics) but because the themes that emerged could be applicable to comparable cities either domestically or elsewhere.

As stated above, the research identified six themes regarding the decision-making environments for park provision applicable to Sydney and six key elements essential to ensure effective park provision not only in Sydney but to other jurisdictions around the world operating in a multi-tiered democratic system of urban governance. These themes and elements, as discussed throughout the thesis, build upon existing research that calls for greater understanding and resourcing to ensure

open space provision is fit for purpose and adequately resourced and implemented as cities densify.

On a more theoretical level, this research provides more than a commentary on the urban governance processes in relation to open space provision across Sydney. It provides a nuanced and critical perspective on the barriers and enablers to park provision from planners, the very people who are tasked at the intersection of policy and practice. Therefore, if anyone is going to understand the decision environments and supply mechanisms for open space provision, it is the people who manage the consequences of how well the six key elements identified by this research as crucial to park provision are able to be used. It is also planners whose capacity to implement good open space outcomes is frequently dependant on political agendas, market drivers and the increasing push toward neoliberal planning ideals, whereby the public benefit of a park is seen as less important in comparison to other more economically productive amenity. As noted throughout this thesis, these are not concepts that are unique to Sydney. Other cities in Australia and around the world could benefit by the insights provided by this case study.

Furthermore, the benefits of open space are widely established, particularly in relation to urban health and urban health outcomes. Therefore, while the understanding of the more pragmatic concerns of how much open space is enough, and how, why, and by whom is it being used, what is equally important beyond the value add of parks as a public amenity is how they can be effectively supplied in an increasingly constrained set of urban governance context to ensure healthy, functional and sustainable urban environments moving forward. This is not only from a city-shaping discourse perspective, whereby scalable frameworks are accounted for and diverse and quality open space outcomes are appropriately enforced, but from a perspective that meets the daily requirements of current and future city-dwellers to remain healthy, active, and productive contributing members of society. This is an important distinction to make, as increasingly there is a need to create healthier cities and city environments that are not only sustainable and adaptable to increased climate risks, but cities that can service the expected increase in population growth and the likely burdens that is going to impose on the natural environment.

From a methodological standpoint, this research demonstrates how to apply a pilot test and a two-round Delphi approach followed by separate semi-structured interviews to explore a diversity of opinions and experiences from a panel of planning experts regarding the barriers and enablers to new local park provision across Sydney. The value of the Delphi method in a Sydney context lay in its ability to circumvent power imbalances between government organisations, and by extension research participants, and give equal weighting to the multiple layers of statutory governance in relation to urban planning in such a diverse region. Past research has pointed to an imbalance of power between state and local governments, with local councils feeling they have less power than their state counterparts. The Delphi method, because it protected participants' anonymity, allowed them to express their opinions fully and honestly regarding local park provision outside the public hierarchy of power relations and within the organisations themselves. Participants in the semi-structured interviews were afforded the same level of anonymity as the Delphi participants even when it was not requested. Furthermore, using a Delphi study in a Sydney-based context contributes to building a rigorous body of research specific to Sydney in relation to open space provision, as well as highlighting the Delphi methodology as an appropriate research tool for urban planning.

The critical perspective brought by the experienced urban planners participating in the Delphi study highlighted that current public funding sources could not meet park provision requirements and demand, but the alternative option of reliance on developer contributions was even less satisfactory. Lack of land availability for open space provision was seen as problematic, especially in already densified parts of the city, and was anticipated to get worse as urban development continued. Community expectations for park provision were acknowledged as changing and becoming more difficult to implement within existing local government capacity. This is because community indicated a greater want for more sophisticated amenity. In some instances, there was a marked shift away from passive to more active recreation and active recreational spaces. Many of these new activities were not organised or overseen by formal sporting clubs or organisations, so local governments were assuming a significant administrative burden as a result. The research further demonstrated the ineffectiveness of population per hectare ratios as a means of setting goals for open space in a rapidly densifying city. It also demonstrated the lack

of effectiveness of existing open space policies to the implementation of open space provision. Lastly, it illustrated a lag in uptake of park innovation approaches within a densifying city.

This thesis has contributed to the field of data presentation and visualisation by including an element of accessible data visualisation. As far as the researcher is aware, this is the first thesis outside of traditional disciplines explicitly related to processes of inclusive data visualisation and/or related to disability/inclusive research topics. A version of this approach is sometimes used in science to systematically present the visual elements of the data alongside a linked narrative to accommodate reading and comprehension preferences of difficult scientific concepts. Unlike usual data practices (if implemented well), the data in this research is not hidden behind protocols of W3CG practices. This is a valuable contribution to social science research as it illustrates the applicability of accessible data visualisation in a traditional research setting that rarely considers such factors as relevant, impactful or valuable.

8.9 Research limitations

There are several well-documented limitations of the Delphi and semi-structured interview methods. These include natural time constraints, external influences on respondent uptake of research participation and researcher experience. Further, the research study was limited to a specific geographic area and a snapshot in time and used a strict criterion for participation. There was a small pool of potential eligible respondents who were suitably qualified and experienced. At the time of participant recruitment, there were eight NSW state government entities that were considered to have a direct vested interest or remit in park provision and 30 local councils across Sydney that had direct jurisdictional responsibility for park provision.

Every reasonable effort was made to ensure the rigour of the research using primary and secondary data to strengthen the rigour of the results and care was taken to avoid any self-selection bias.

8.10 Conclusion

The cityscape of Sydney is changing and becoming increasingly complex as the demand for resources continues to evolve. Urban liveability in relation to open space provision is relevant to academia, political agendas, planners, industry professionals, developers and the community, not only within Sydney but further afield. Sydney was chosen for this research as a case study area due to the researcher's familiarity with the area, its position as the economic capital of Australia, its global narrative, its transformation toward a region and its rapidly changing urban form. Many of these traits are experienced by other cities across the globe.

This research aimed to provide a case study of challenges and opportunities for new parks during a period of significant population growth and shifting urban governance and metropolitan institutions (the Greater Cities Commission). It also aimed to establish a repeatable and scalable means of evaluation for new park provision decision-making mechanisms by providing a sound and robust methodology, ensuring that the impact of the research would be greater than the immediacy of the case study area or timing of the work, and offer value to other cities in similar circumstances.

Access to open space has always been and will continue to be a key element of "the public benefit". Therefore, examining how debates over park provision and policy are framed for implementation provides valuable insight into the changing strategic values attached to urban parks.

This research contributes to qualitative public policy debates about the value of parks compared to "hard" infrastructure, such as roads and housing. Finding consensus between NSW state and local entities is a challenge that needs to be overcome, given that the research found they have divergent perceptions and priorities regarding city-shaping discourse and implementation of infrastructures such as roads, rail, housing and open space provision. NSW state entities often emphasise regulatory and funding mechanisms, while local entities focus on the practical challenges of land acquisition and community needs. The Delphi study revealed that NSW state government agencies tended to prioritise strategic planning and funding allocation, whereas local councils were more concerned with immediate implementation issues, such as land availability and community demands. This

discrepancy highlights the need for a more integrated approach that considers both strategic and operational perspectives to ensure effective park provision.

In response to the research questions, this thesis concludes that:

1. Ensuring adequate levels of new park provision in Sydney, Australia, requires adequate funding and availability of suitable land. In addition to this, ensuring that any new parks are locally appropriate and respond directly to the needs of local community and require greater levels of community engagement.
2. The research findings indicate that deficits in park provision may be overcome by enhancing funding mechanisms, improving land-use policies and fostering stronger community involvement. Examples of some strategies towards this include leveraging developer contributions, state grants, and other possible sources of revenue or resourcing, as well as increasing innovative land-use approaches, such as rooftop parks and shared spaces. There is a consensus among policy actors on the importance of these strategies, yet effectiveness varies by locality. The Delphi study and semi-structured interviews indicated that while state and local entities agree on the need for increased funding and innovative land use, success in implementation is uneven. NSW local councils often face more significant challenges in densely populated areas, requiring more innovative and tailored solutions to meet their unique needs, which points to the need for flexible policy frameworks that can adapt to local conditions.
3. In addressing the question of geographic advantage, this research found that some localities, particularly those in brownfield areas, experienced sharper deficits in terms of park provision, due to higher land costs and limited availability. To address these local disadvantages, targeted interventions such as increased state funding, land acquisition policies and community-driven park initiatives are essential. Strategies need to be revised to incorporate more flexible standards for open space that reflect the unique characteristics of each locality. For instance, adopting a more functional approach to open space standards that considers high streets, linear parks and pop-up parks can address local needs better. Additionally,

enhancing community engagement and prioritising innovative park designs can help overcome these deficits. This research emphasises the importance of adapting park provision strategies to local contexts to ensure equitable access to green spaces across all urban areas.

The findings of this research are of benefit to multiple stakeholders including politicians, policy makers, planners, developers, and the community. This is because the findings of this research increase the understanding of the practical constraints currently facing park provision across Sydney in the current decision-making environment. By identifying not only the decision-making environments regarding park provision faced by planners, but the six crucial elements to park provision effectiveness, this increased understanding allows for more appropriate open space-based outcomes to emerge. Many of the conclusions reached in this research are acknowledged across the academic literature and policy documents alike, thereby reaffirming the direction in which policy outcomes and resources should be directed to ensure appropriate open space outcomes that are sustainable, functional and fit for purpose in a rapidly densifying city. This research shows that policy, however, has not been adaptable enough in the face of rapid change and that more needs to be done to ensure the adequacy of park provision. This is because, if steps are not taken to protect and enhance the value and implementation of park provision, city-dwellers will find themselves in urban environments that do not function – the results of which could be devastating for humanity and biodiversity alike.

Open space provision is a natural contributor to climate regulation, air quality and sound, among other widely documented benefits, particularly in urban environments. Therefore, to not consider open space and green infrastructure as essential and worth investing in and implementing is to our own peril and that of the planet.

The conclusions identified in this research regarding how to provide effective park provision are a road map for decision-makers. Funding, land availability, community expectation and engagement, open space standards, policy priorities and objectives, and park innovation are essential for open space provision, and by identifying these key elements, stakeholders are provided with an opportunity to engage with greater clarity on what matters most. As stated previously, these elements are not linear and different stakeholders will focus on different elements

depending on context. Further research is required regarding each of these elements and how they can be adopted in a more synergistic approach to create better open space outcomes into the future. Using Sydney as a case study, this research provides a scalable and repeatable methodology of assessing open space provision and identifies tangible steps to ensure better open space outcomes are considered for the future.

The conclusions drawn across this thesis, although directly representative of Sydney as a case study, particularly as exampled throughout the chapter, are linked to issues of urbanisation and the mechanisms therein such as urban governance, policy effectiveness, resource allocation and the competition of rights, social and political values, and urban economies – topics that have been further addressed throughout this case study. This research is more than a case study about parks; it is an examination on how open space as a crucial element of urban form is provided and contributes to the wider theoretical debates of urban planning and city-shaping discourse.

This research, although primarily focused on the provision of new open space in a rapidly densifying environment, is embedded in broader theoretical and practical debates on the way growing cities are planned, and how outcomes are implemented. Through using Sydney as a case study area and examining the implementation and implications of open space provision, this research provides valuable insight into discourse regarding the problematisation of neoliberal governance, the political economy of planning systems and the increased reliance of private entities to provide a public good such as park provision.

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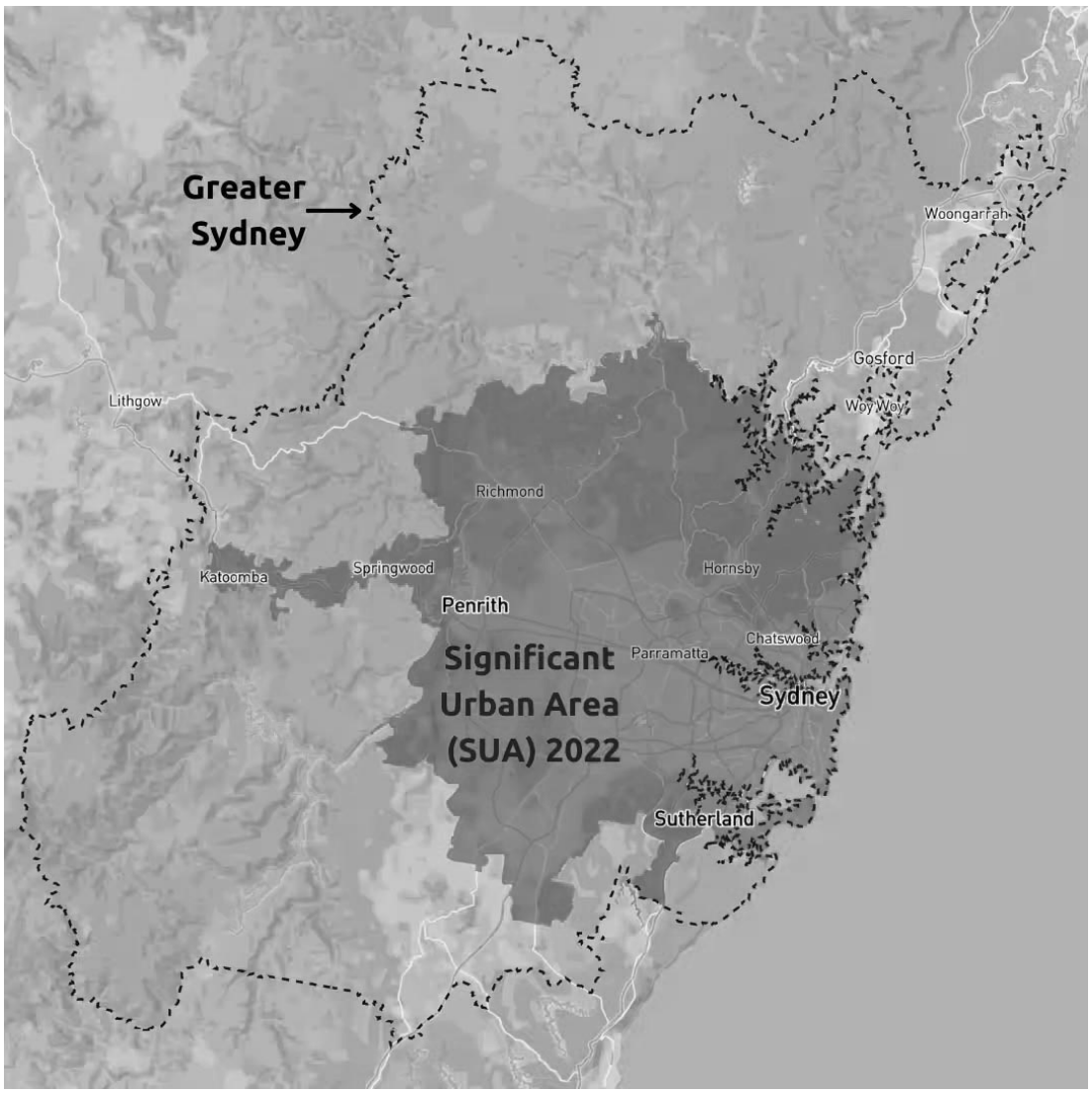
Appendix

Appendix A: Greyscale maps and figures

Figure A1
Map of Metropolitan Sydney LGAs by brownfield and greenfield areas

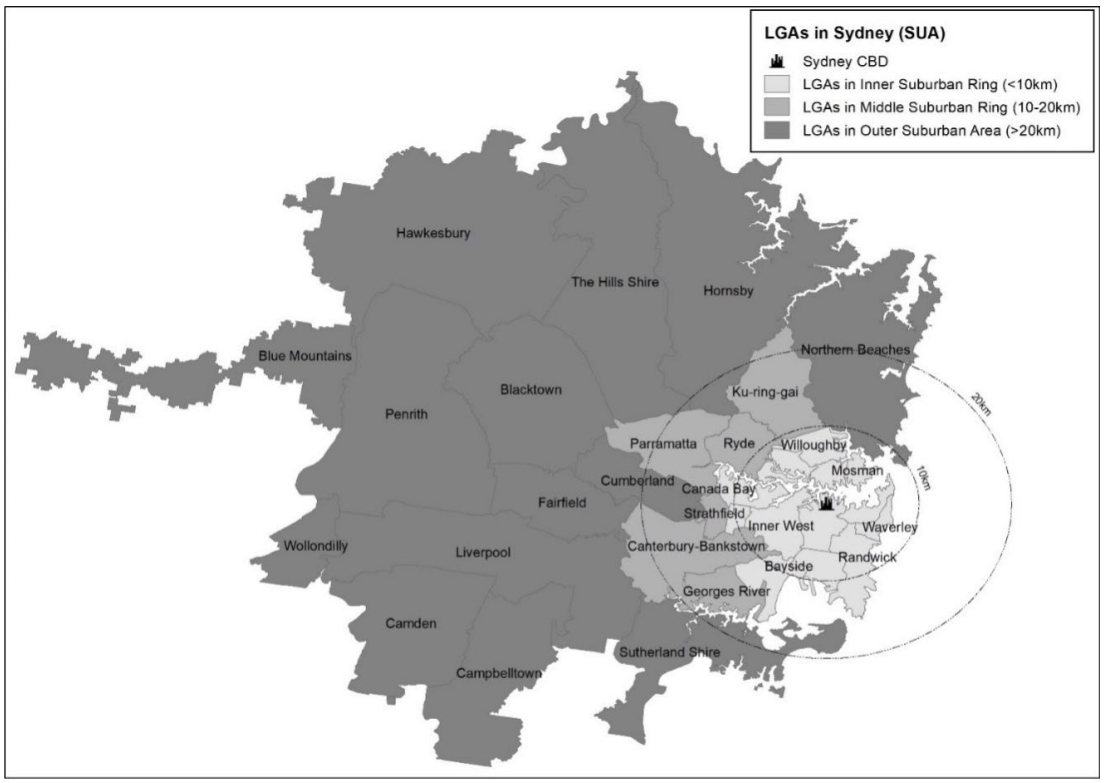
Source: Author.

Figure A2
Greater Sydney and the Sydney SUA



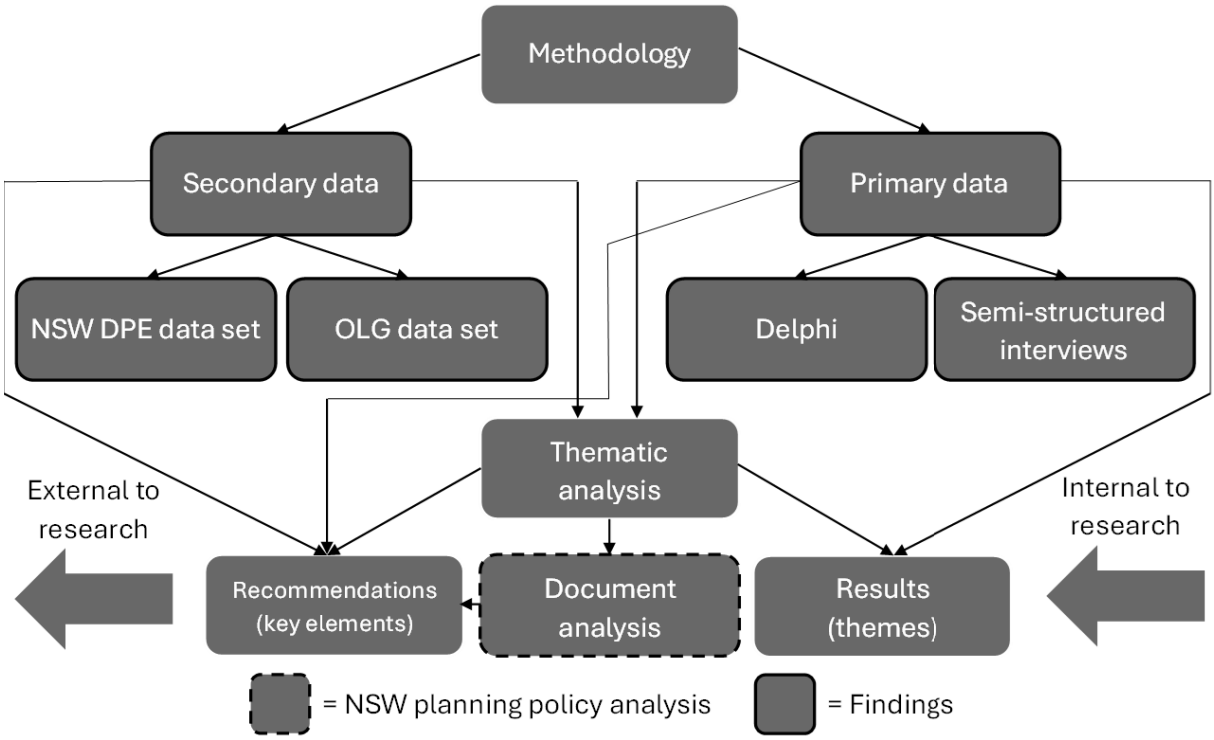
Source: Riches and Baghdadi (2023).

Figure A3
Map of Sydney (SUA) showing LGAs in the Inner Suburban Ring, Middle Suburban Ring and Outer Suburban Area.



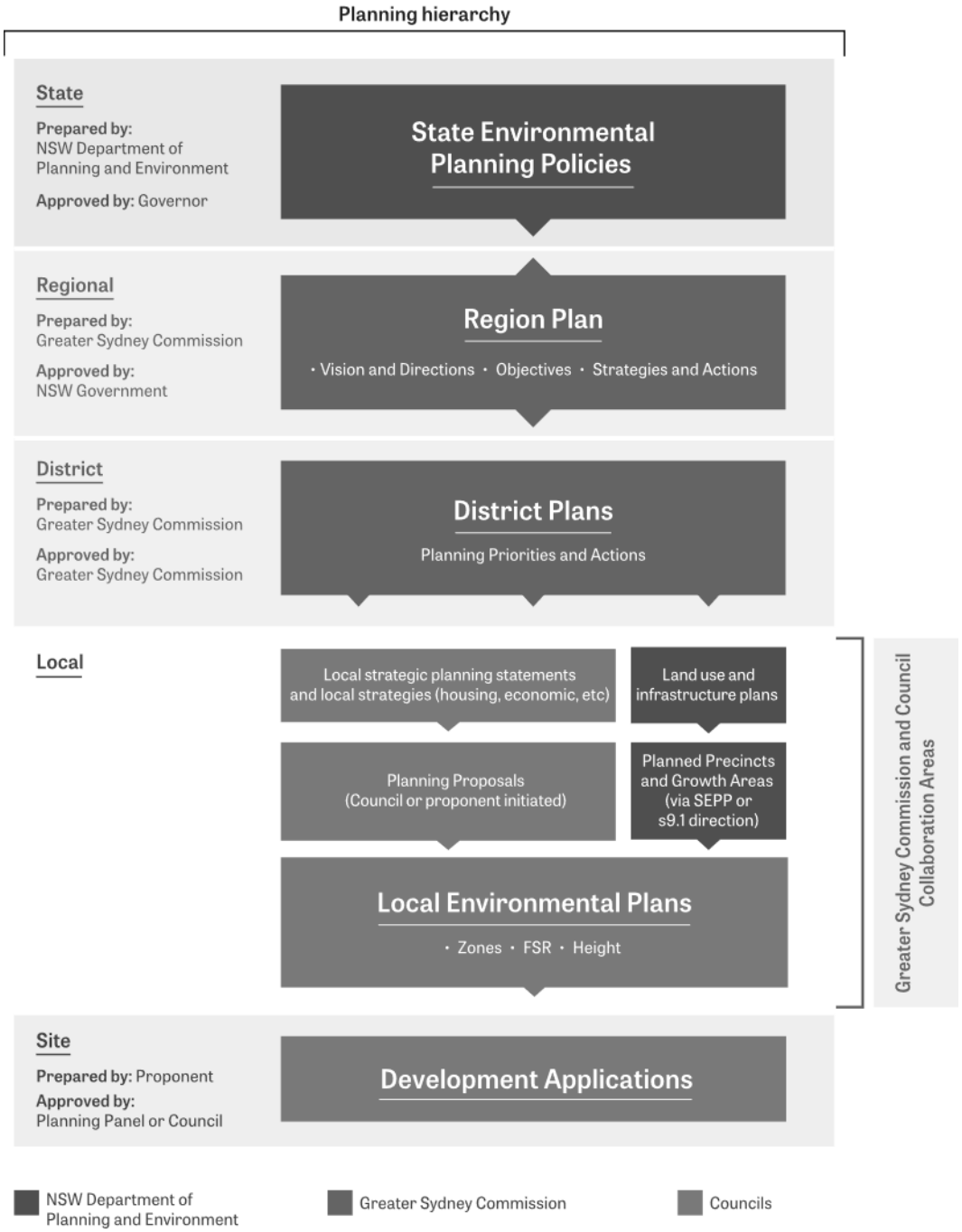
Source: Author.

Figure A4
Summary of methodology



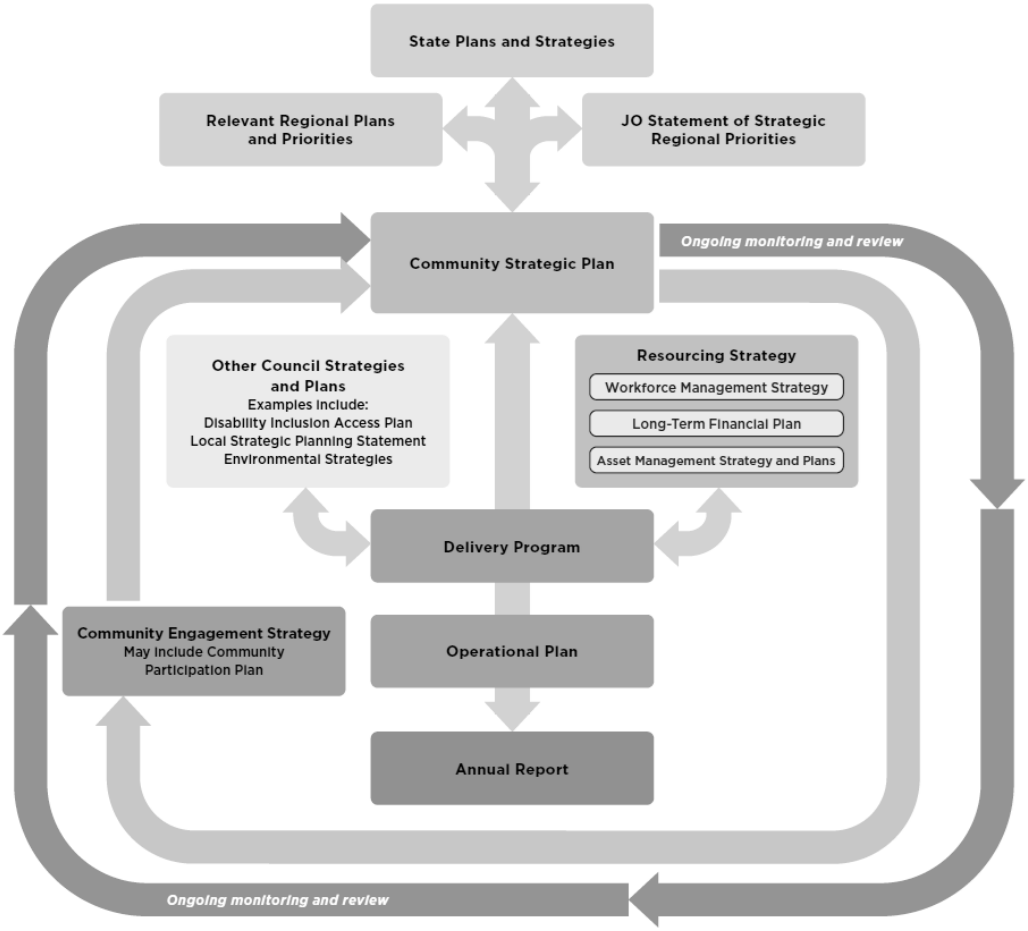
Source: Author.

Figure A5
Roles of planning authorities in Greater Sydney



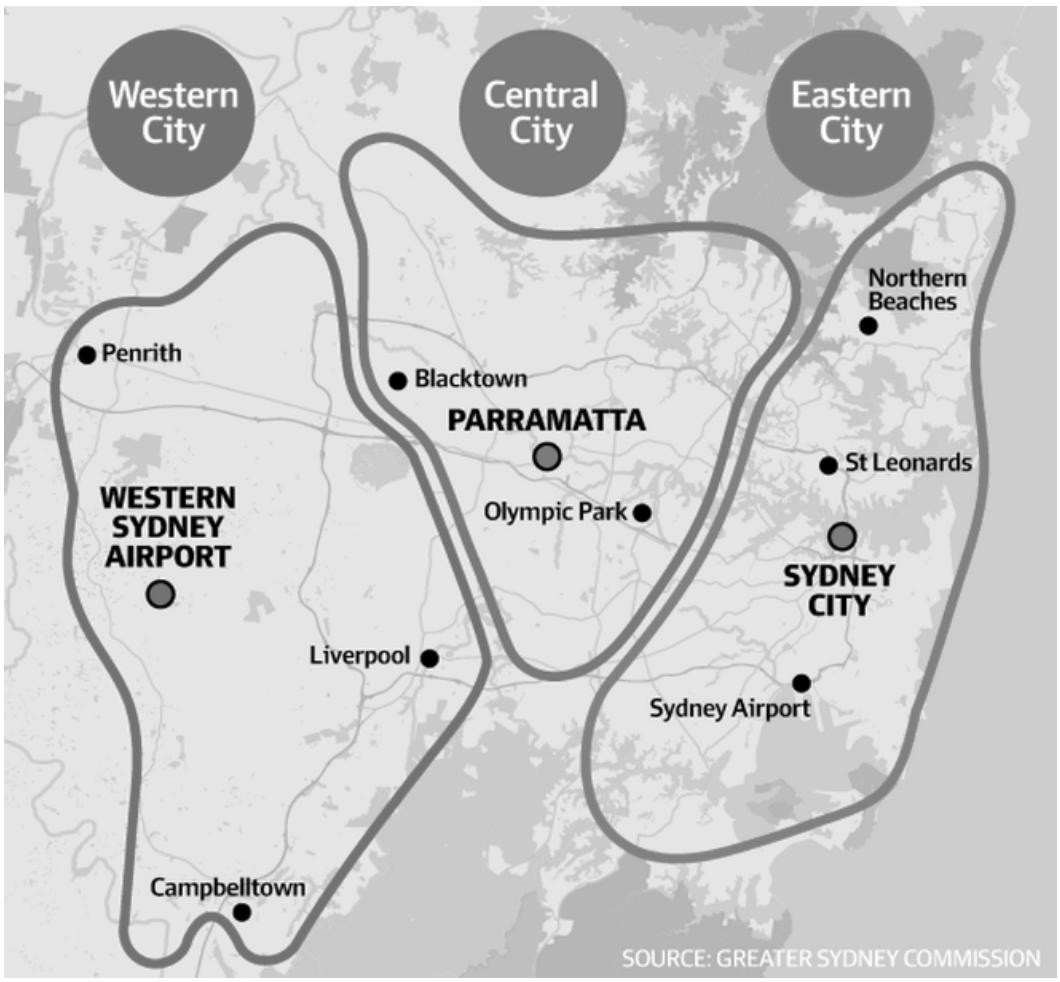
Source: GSC (2018b).

Figure A6
NSW Integrated Planning and Reporting framework for local councils



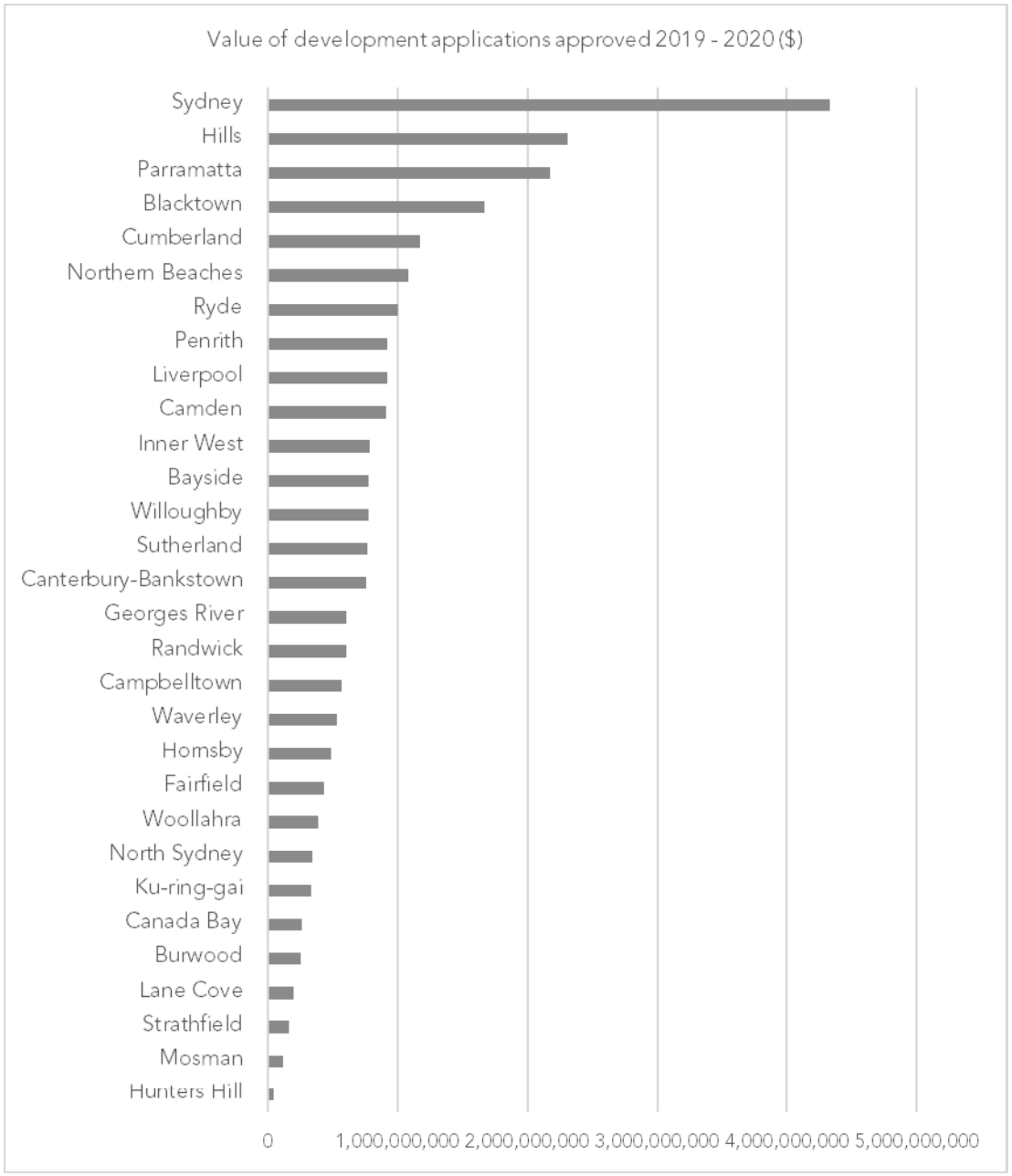
Source: OLG NSW (2024a).

Figure A7
Map of the three cities included in the *A Metropolis of Three Cities* plan



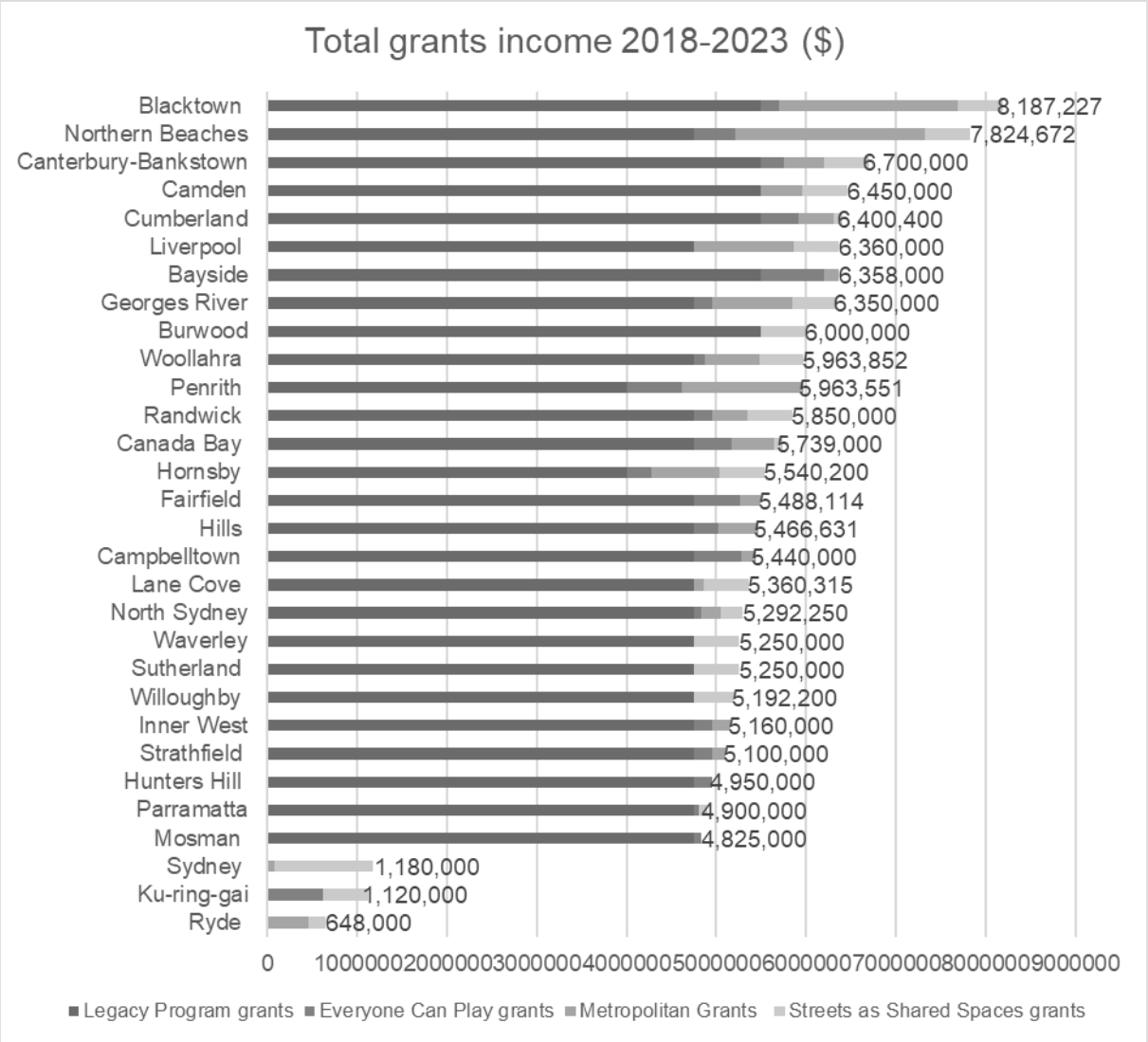
Source: GSC (2018b).

Figure A8
Value of development applications approved 2019-2020 by LGA, ranked by magnitude



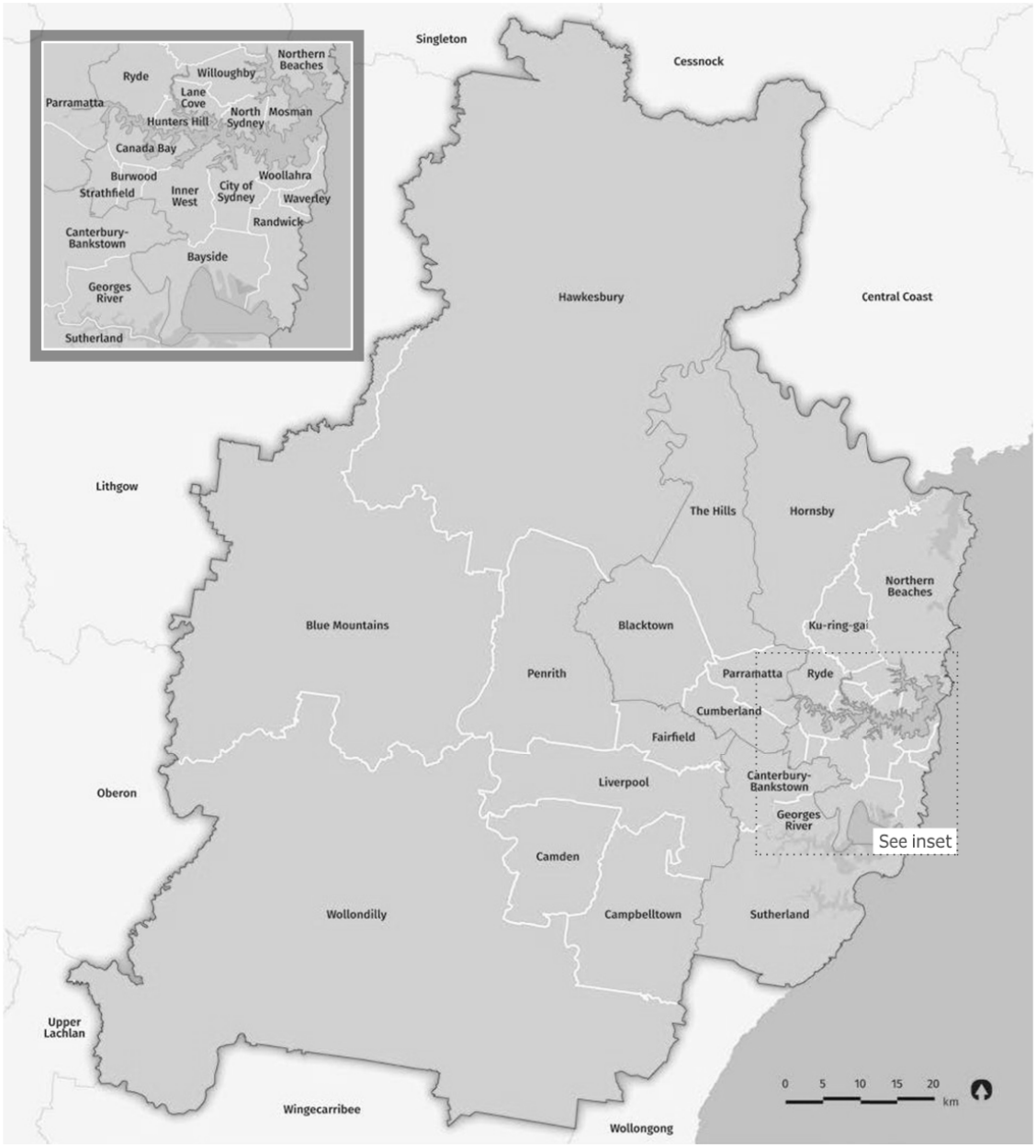
Source: Author. Adapted from OLG NSW (2024b).

Figure A9
Total income from *the Metropolitan Greenspace, NSW Legacy, Everyone Can Play* and *Streets as Shared Spaces* programs 2018-2023, by LGA, ranked by magnitude



Source: Author. DPHI NSW (2024d), DPHI NSW (2024h), DPHI NSW (2024i), and TFNSW (2024b).

Figure A10
Five district map



Region Boundary

District Boundary

Local Government Area

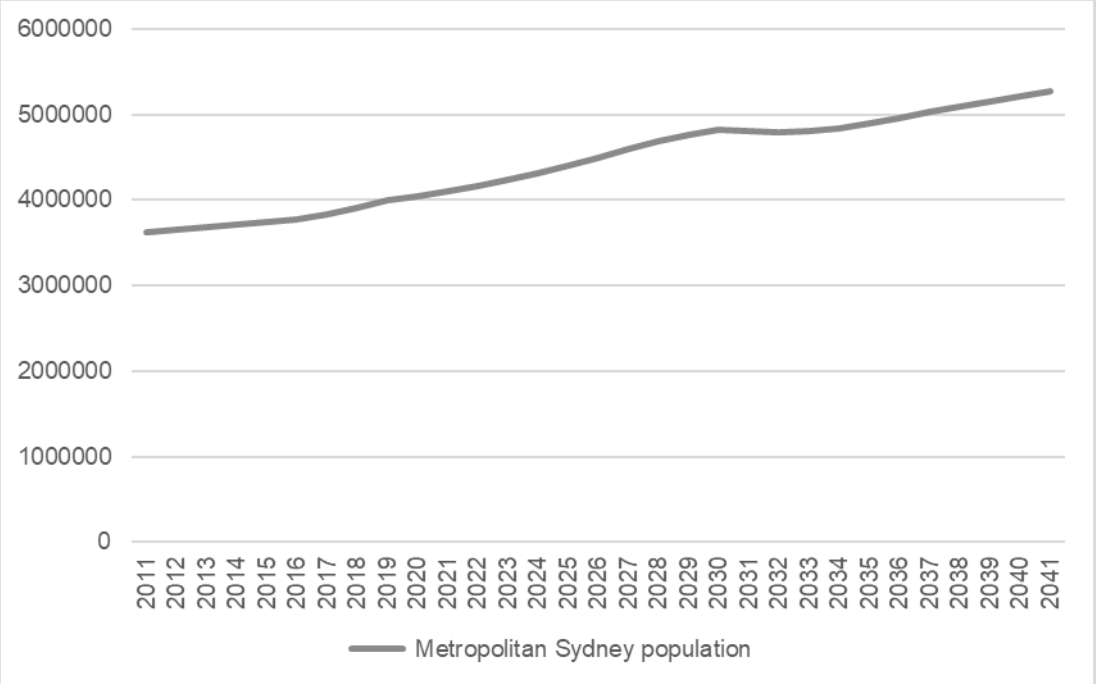
Waterways

DISTRICTS

Central City	Blacktown, Cumberland, Parramatta, The Hills
Eastern City	Bayside , Burwood, Canada Bay, City of Sydney, Inner West, Randwick, Strathfield, Waverley, Woollahra
North	Hornsby, Hunter's Hill, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Northern Beaches, Ryde, Willoughby
South	Canterbury–Bankstown, Georges River, Sutherland
Western City	Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith, Wollondilly

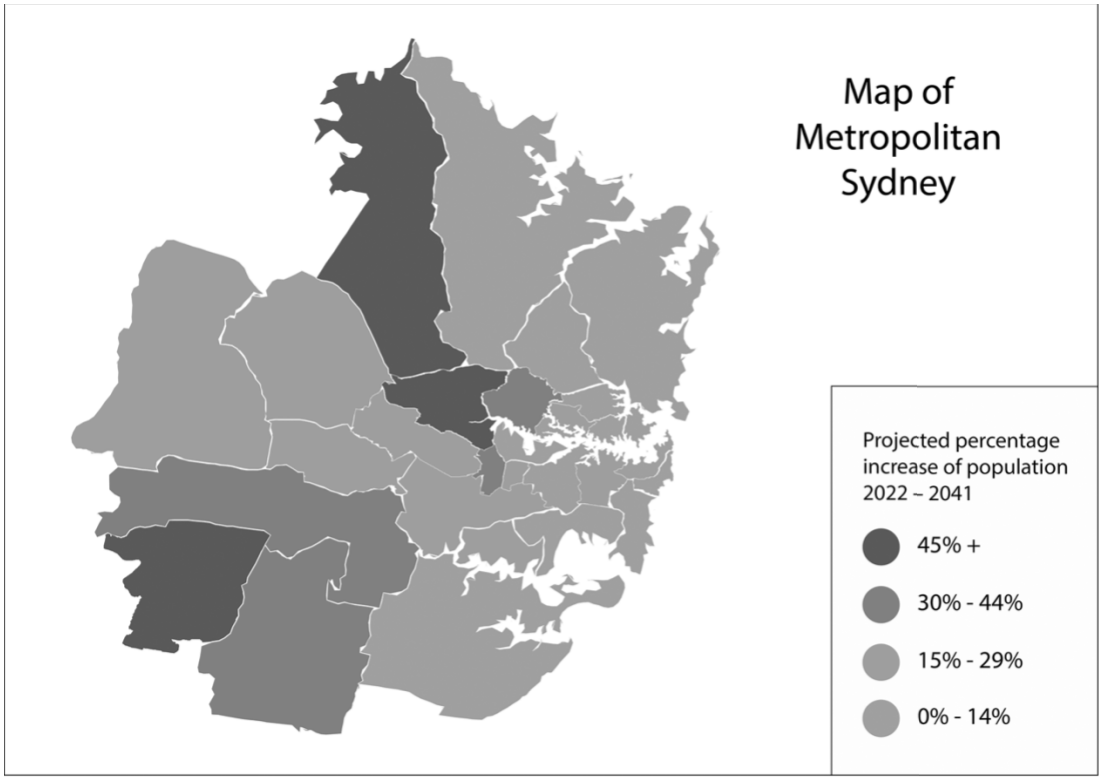
Source: GSC (2018b).

Figure A11
Annual Sydney population projections from 2011 to 2041



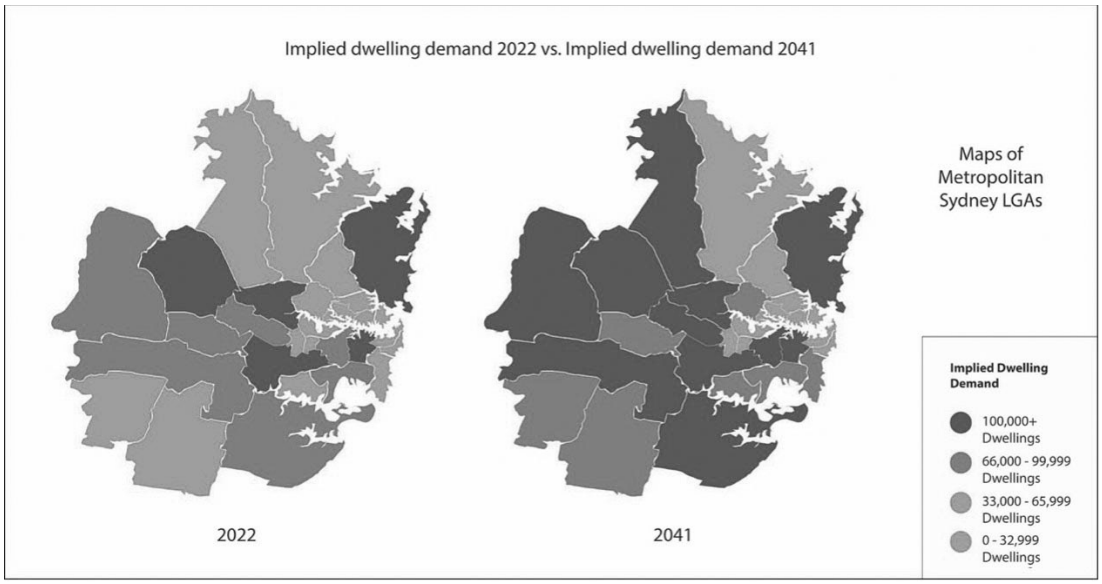
Source: Author. Adapted from DPIE NSW (2020).

Figure A12
Percentage population growth 2022-2041 by LGA.



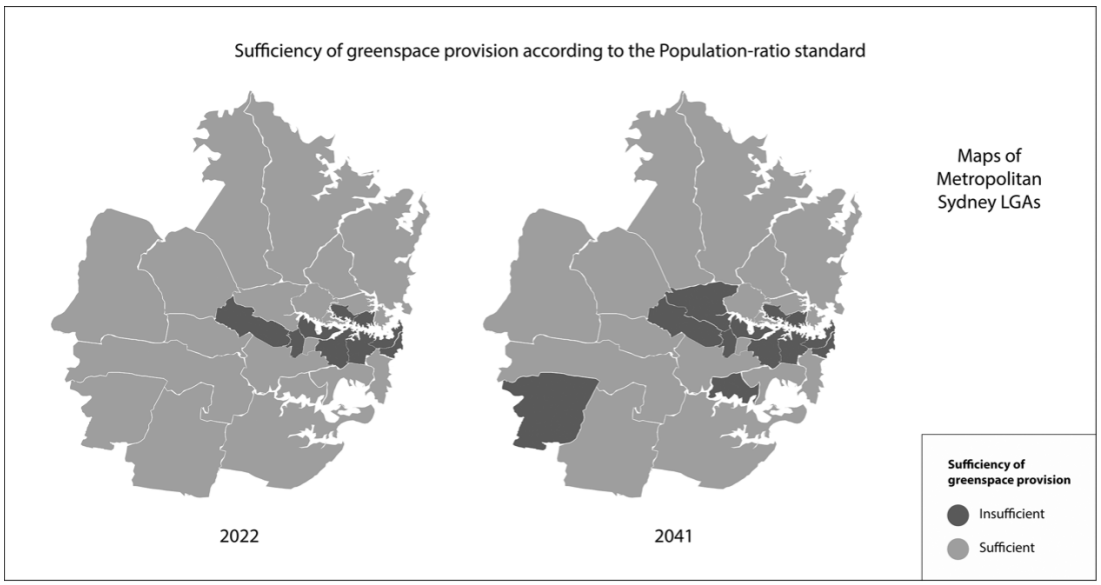
Source: Author. Adapted from DPIE NSW (2020).

Figure A13
Comparison of implied dwelling demand in 2022 and 2041, by LGA.



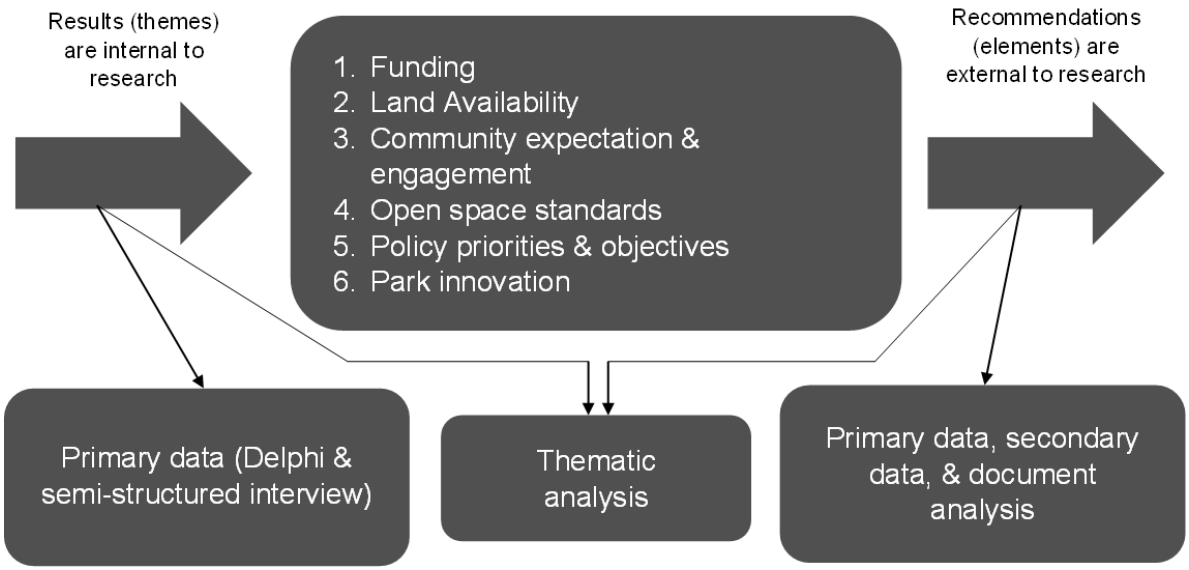
Source: Author. Adapted from DPIE NSW (2020).

Figure A14
Population ratio standard open space land sufficiency 2022 and 2041, based on 2022 population and projected 2041 population, by LGA



Source: Author. Adapted from OLG NSW (2024b) and DPIE NSW (2020).

Figure A15
Summary of themes vs elements



Source: Author.

Appendix B: Primary Collection Research Tools

Delphi Round 1 Questionnaire - April 2022

Acknowledgement to Country

UTS acknowledges the Gadigal people of the Eora Nation, the Boorooberongal people of the Dharug Nation, the Bidiagal people and the Gamaygal people, upon whose ancestral lands our university stands. We would also like to pay respect to the Elders both past and present, acknowledging them as the traditional custodians of knowledge for these lands.

Welcome

Welcome to round one of the Planning, Funding and Implementing Local Park Provision Post-COVID: Delphi Survey.

This is the first of three surveys you will be asked to participate in over the following three months. It is anticipated that this survey should take no more than 40 minutes to complete.

In this first survey, you will be asked about the influences regarding local park provision within your jurisdiction. Questions will relate to planning, priorities, metropolitan attributes, developer contributions, and the advent of COVID-19 on local park provision.

The responses to this survey will be analysed and the results will inform the next round of questions. You will be notified by email when the next survey is due to begin.

Your personal data will not be shared with other participants. Your responses will be used anonymously within the data collation and distribution process, and you can skip any questions you are not comfortable with, although it is hoped that all questions will be answered to the best of your knowledge to help ensure the rigor and value of the data findings.

Your data will be stored according to Australian privacy information standards, as outlined in previous correspondence.

Once again, thank you for your time, consideration, and resources regarding your participation in my research.

Q1- Consent

I agree to participate in the below questionnaire, and confirm the following:

I have read the Participant Information Sheet, or someone has read it to me in a language that I understand. I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions, and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I am aware that I can contact the researcher Megan Taylor (megan.k.taylor@student.uts.edu.au) or her primary supervisor Heather MacDonald, academic in planning and Deputy Dean in the Faculty of Design, Architecture and Building at UTS (heather.macdonald@uts.edu.au) if I have any concerns about the research.

Consent:

I Agree

I Disagree

Introduction

Please answer all questions based on your professional experience. Most questions ask about your current agency or jurisdiction. If you prefer to base your answer on a previous position (or experience in several positions) please note this in your answer.

For each question, please choose the option most applicable to your jurisdiction or professional situation. For example, some jurisdictions only have redeveloping (brownfield) areas, while others include a combination of developing (greenfield) and

redeveloping (brownfield) areas. Comparisons between greenfield and brownfield sites are only needed when your jurisdiction includes both types of sites.

For the purposes of this survey, a local park refers to a public open space specifically set aside for passive recreation. This may include several if not all of the following amenity or attributes:

- green vegetation, grass, landscaping
- children's play equipment and/or adult exercise equipment
- water features/water play
- taps, bubblers, toilets
- seating, lighting and/or footpaths
- fencing and/or rubbish bins
- sized between 0.05 and 5 hectares

Note, these amenity/attributes are a guide only. For example, if your jurisdiction predominantly handles larger parcels of land, please make a note of this in your answer.

Preliminary Questions

The preliminary set of questions are for statistical purposes only. The total numbers will be used to verify the discussion chapter of my thesis. Please check the most applicable to your situation.

Q2 - I work for:

NSW LGA

NSW State Government Agency

Q3 - My LGA is in a predominantly:

Developing (greenfield) area

Redeveloping (brownfield) area

Both developing (greenfield) and redeveloping (brownfield) area

Q4 - My LGA is in a predominantly:

Inner suburban ring

Middle suburban ring

Outer suburban ring

Q5 - I have been working in the planning/relevant profession/industry/sector for:

0-5 years

6-10 years

11-more years

Influences on Local Park Provision

Q6 - Do LGAs prioritize larger urban parks (district/regional) over local parks because costs of the former are shared with the NSW State Government?

Yes

No

Q7 - How important are each of these priorities for decisions about the location, type, and size of a new local park development?

Options:

Very Important

Somewhat Important

Not Important

Don't Know

Not applicable

Categories:

Availability of/opportunity for funding

Land availability near identified park need

Population density/and or dwelling type

Community demand

Local /Jurisdictional political priorities

Identified need to improve liveability or area branding

Metropolitan or district plan priority

Local strategic plan priority

Developer offer in VPA

Q8 - What is the most significant barrier to new local park provision within your jurisdiction?

Q9 - What is the most significant enabler to new local park provision within your jurisdiction?

Q10 - What is one thing that could improve local park provision within your jurisdiction?

Planning for Local Park Provision

Q11 - How is local park provision planned for in your jurisdiction?

Q12 - How well are state/metropolitan strategic priorities engaged with in a local planning context?

Q13 - Can you provide an example of cross-jurisdictional coordination/collaboration (e.g. between neighbouring LGAs)?

Q14 - Have Strategic District Plans encouraged a more coordinated approach to local park planning?

Yes

No

Q15 - Have the recent adjustments in population forecasting by the ABS based on COVID-19 changed the future forecasting of local park provision within your jurisdiction?

Yes

No

Local Park Provision in Developing or Redeveloping Areas

Q16 - Several factors may be considered in identifying priority sites for new local parks. Please rate the importance of each of the following factors in evaluating new local park locations:

Options:

Very Important

Somewhat Important

Not Important

Don’t Know

Not Applicable

Categories:

Metropolitan location (inner, middle, or outer ring)

Proportion of low-income residents in local area

Predominant dwelling type (detached homes, medium, or high rise)

Population density in local area

Predominant household structure (families with children, singles)

Indigenous cultural significance

Tenure type (renters or owners)

Surrounding land uses (current or planned)

Site features (topography, vegetation)

Age distribution (children, older adults)

Q17 - Is greater priority placed on new local park provision in your jurisdiction based on specific attributes? Please rate the extent to which each attribute in the following questions increases the priority placed on new local park provision.

Questions 17.1 -17.7 were shown If participants had selected corresponding answers within the Likert scales in Q16.

Q17.1 - What level of priority is placed on new local park provision in your jurisdiction with the following metropolitan location attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Inner ring suburb location

Middle ring suburb location

Outer ring suburb location

Q17.2 - What level of priority is placed on new local park provision in your jurisdiction with the following income category attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Lower 40% of NSW income distribution

Middle 40-80% of NSW income distribution

Upper 20% of NSW income distribution

Q17.3 - What level of priority is placed on new local park provision in your jurisdiction with the following dwelling type attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Mainly detached housing

Mainly semi-detached or attached housing

Mainly one to three story apartment buildings

Mainly four or more story apartment buildings

Q17.4 - What level of priority is placed on new local park provision in your jurisdiction with the following demographic attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Student/young professional population

Families with children population

Older population

Population with disabilities

Q17.5 - What level of priority is placed on new local park provision in your jurisdiction with the following tenure type attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Majority rental

Majority homeowner

Q17.6 - What level of priority is placed on new local park provision in your jurisdiction with the following land use attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Availability land

Affordably priced land

Open space needed adjacent to infrastructure or amenity

Adjacent to or near other urban parks

Crown land

Q17.7 - What level of priority is placed on new local park provision in your jurisdiction with the following land type attributes:

Options:

High Priority

Average Priority

Not a Priority

Don’t Know

Not applicable

Categories:

Historical or cultural significance of site

Suitable slope, views, vegetation, or other physical features

Local Park Provision in Developing or Redeveloping Areas Continued

Q18 - Are Developer Contribution requirements adequate for local park provision in redeveloping (brownfield) and/or developing (greenfield) areas?

Yes, adequate in both

Adequate in redeveloping but not developing areas

Adequate in developing but not redeveloping areas

No, inadequate in both

Q18.1 - Based on your previous answer, please elaborate as to why this is so.

Q19 - Are Voluntary Planning Agreements more effective than Developer Contribution requirements for local park provision in redeveloping (brownfield) and/or developing (greenfield) areas?

Yes, VPAs more effective in both developing and redeveloping areas

VPAs more effective in developing but not redeveloping areas

VPAs more effective in redeveloping but not developing areas

No, VPAs ineffective in both developing and redeveloping areas

Q19.1 - Based on your previous answer, please elaborate as to why this is so.

Effects of COVID-19 on Local Park Provision

Q20 - Has the advent of COVID-19 changed how new local park priorities are ranked in your jurisdiction?

Yes

No

Question 20.1a and 20.1b were displayed If participants had selected Yes in Q20

Q20.1a - How and why have priorities changed?

Q20.1b - Based on your previous answer, is this satisfactory or would you like to see changes?

Delphi round 2 Questionnaire - July 2022

Acknowledgement to Country

UTS acknowledges the Gadigal people of the Eora Nation, the Boorooberongal people of the Dharug Nation, the Bidiagal people and the Gamaygal people, upon whose ancestral lands our university stands. We would also like to pay respect to the Elders both past and present, acknowledging them as the traditional custodians of knowledge for these lands.

Welcome

Welcome to round two of the Planning, Funding and Implementing Local Park Provision Post-COVID: Delphi Survey. This is the second of three surveys you will be asked to participate in over the following months. It is anticipated that this survey should take no more than 40 minutes to complete. Many of the topics covered within the first round showed substantial consensus among the group. Thank you for your thoughtful responses.

In this second survey, you will be asked more about local park design, developer contributions, and cross-departmental collaboration opportunities regarding local park provision within your jurisdiction. Questions will relate to alternative local park design, uses of public open space, developer contributions and funding mechanisms, local park maintenance budgetary allocations, strengthening inter-departmental collaborations, and other local park provision considerations.

The responses to this survey will be analysed and the results will inform the next round of questions. You will be notified by email when the next survey is due to begin. Your personal data will not be shared with other participants. Your responses will be used anonymously within the data collation and distribution process, and you can skip any questions you are not comfortable with, although it is hoped that all questions will be answered to the best of your knowledge to help ensure the rigour

and value of the data findings. Your data will be stored according to Australian privacy information standards, as outlined in previous correspondence.

Once again, thank you for your time, consideration and resources regarding your participation in my research.

Q1 - Consent

I agree to participate in the below questionnaire and confirm the following: I have read the Participant Information Sheet, or someone has read it to me in a language that I understand. I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet. I have had an opportunity to ask questions, and I am satisfied with the answers I have received. I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney. I am aware that I can contact the researcher Megan Taylor (megan.k.taylor@student.uts.edu.au) or her primary supervisor Heather MacDonald (heather.macdonald@uts.edu.au) academic in planning and Deputy Dean in the Faculty of Design, Architecture and Building at UTS if I have any concerns about the research.

Consent:

I Agree

I Disagree

Introduction

Please answer all questions based on your professional experience. Most questions ask about your current agency or jurisdiction. If you prefer to base your answer on a previous position (or experience in several positions) please note this in your answer.

For each question, please choose the option most applicable to your jurisdiction or professional situation. For example, some jurisdictions only have redeveloping

(brownfield) areas, while others include a combination of developing (greenfield) and redeveloping (brownfield) areas. Comparisons between greenfield and brownfield sites are only needed when your jurisdiction includes both types of sites.

For the purposes of this survey, a local park refers to a public open space specifically set aside for passive recreation. This may include several if not all of the following amenity or attributes:

- green vegetation, grass, landscaping
- children's play equipment and/or adult exercise equipment
- water features/water play
- taps, bubblers, toilets
- seating, lighting and/or footpaths
- fencing and/or rubbish bins
- sized between 0.05 and 5 hectares

Note: these amenities/attributes are a guide only. For example, if your jurisdiction predominantly handles larger parcels of land, please make a note of this in your answer. Other public open space definitions used within this second round are provided immediately before their respective questions.

Preliminary Questions

Q2 - I work for:

NSW LGA

NSW State Government Agency

Emerging Themes

Three main themes emerged from the first round, which will be explored further within this second round.

Theme 1: Park design

Theme 2: Adequacy of Developer Contributions and funding mechanisms

Theme 3: Inter-departmental collaboration and uses of public open space

Theme 1: Park Design

A recurring theme in the first round of Delphi responses related to the exorbitant land costs, and a scarcity of land available for new local park provision, particularly in redeveloping (brownfield) areas. Many brownfield areas are (or are soon to become) densely populated, and often under-supplied compared to benchmarked local park provision guidelines.

Q3 - The Role of Benchmarks

Some respondents suggested that while benchmark standards for local park provision are useful in preparing statutory planning authority documents, standards are impossible to satisfy given limited land supply and high costs. Do you agree with the above statement?

Yes

No

Q3.1 - Based on your previous answer, why not?

Q4 - Are there alternative means of local park provision that go beyond the traditional measurement of per capita that would be more useful in your jurisdiction?

Yes

No

Q4.1 - Based on your previous answer, what are some alternatives?

Q5 - Innovative Design Alternatives

Note: the following definitions apply to this research, and the questions immediately following.

A smart park concept is defined as a park that uses smart digital and/or physical technologies, and/or innovative materials, to improve the efficiency, functionality, use, safety, and sustainability of a park, while increasing public benefit and reducing maintenance costs simultaneously.

A parklet is defined as a temporary pop-up or fixed park located within the average width/depth of a car parking space or transport right of way, that has been converted into a small recreational space, often with some form of vegetation and possible seating option in order to make it person centric rather than vehicle centric. They are often created as a means of improving streetscapes, social connectedness, pedestrianism or foot traffic for local economy, urban amenity and other micro-environmental benefits.

A rooftop park, sometimes referred to as a sky park, or rooftop garden, is a form of ‘semi-intense’ or ‘intense’ green roof. As its name suggests, it is a park located on top of a building or structure, publicly accessible from the street. It contains vegetation, irrigation, seating, lighting, potentially play equipment and other simple amenities for use by the public.

Given the cost and scarcity of suitable land for local parks, are alternative design approaches (such as, but not limited to, smart parks, parklets, or rooftop parks,) a viable solution within your jurisdiction?

Yes

No

Q5.1a - Has your organisation implemented any of these ideas or similar ones?

Yes

No

Q5.1b - Based on your previous answer, how easy or difficult was this compared to traditional local park provision, and why?

Q5.2 - Based on your previous answer, what would be required to implement such ideas?

Q5.3 - Based on your previous answer, what would be required to implement such ideas?

Q6 - In your opinion, based on previous experience of both elected officials' and residents' opinions, how would/do residents and elected officials react to more innovative ways of providing local parks using less scarce land (or reduced operating budgets)?

Q7 - Densification

Responses to the previous Delphi questionnaire showed that increasing densification, particularly along transport corridors and in major precincts and urban hubs, was a challenge for continued expansion of local parks to keep pace with population growth. What can be learned about traditional and alternative approaches to local park provision from other more highly densified cities such as London, Singapore, Tokyo, New York, Toronto, or any other dense city you are familiar with?

Theme 2: Adequacy of Developer Contributions and Funding Mechanisms

Several participants pointed to the inadequacy of Developer Contributions for local park provision in both developing (greenfield) and redeveloping (brownfield) areas.

Whilst Voluntary Developer Agreements are a preferred type of contribution, because they are somewhat more flexible in their approach and implementation, ultimately, they too come with challenges.

Q8 - Developer Contributions

Considering the relative merits of in-lieu contributions towards local park provision on a yet-to-be-identified site versus negotiated contributions of an actual site, with less reliable standards of local park provision, in your opinion, is one of these options less flawed than the other?

Yes

No

Q8.1a - Which option is less flawed than the other?

In-lieu contributions towards local park provision on a yet-to-be-identified site. (1)

Negotiated contributions of an actual site, with less reliable standards of local park provision. (2)

Q8.1b - Based on your previous answer, why?

Q9 - Given that Voluntary Developer Agreements are a negotiated outcome, would improving local authority negotiating skills/position improve local park quality outcomes without impacting other public goods?

Yes

No

Q10 - Would increasing Developer Contributions improve local park quality outcomes without impacting other public goods?

Yes

No

Q11 - If you were to redesign local infrastructure funding mechanisms in NSW, what principles and mechanisms would you use?

Competition from Other Urban Goods

Many participants pointed out that the limited funds available for new local park provision reflected funding priorities and competition from other strategic urban goods. The majority of participants agreed that available funds for new local park development are inadequate, and that this indicates parkspace is a lower priority than other elements of urban infrastructure, for example, mixed use precincts.

Q12 - In your opinion, what accounts for the lower priority placed on local parks compared to other local infrastructure provisions such as foot paths, parking facilities, local streets, and cycleways?

Q13 - If you were advising parkspace advocates, are there strategies you would suggest to increase the priority placed on local parks?

Yes

No

Q13.1 - Based on your previous answer, what would these strategies be?

Q14 - To what extent do ongoing local park maintenance costs reduce local authority prioritisation of new local park space?

Q15 - Is this attributable to rate caps that limit spending, or to other financial factors?

Q16 - How and when is the "public benefit" of a local park evaluated or estimated in your jurisdiction?

Theme 3: Inter-Departmental Collaboration and Uses of Public Open Space

Some participants pointed to the under-use of existing public open space not currently developed as parkspace, and the potential to use existing public open space alternatives more effectively for the public benefit, thereby reducing the pressures that population growth and demand puts on local parks.

Q17 - Multi-use Public Open Space

In your jurisdiction, is there potential to use existing public open space as a local park?

Yes

No

Q17.1 - Based on your previous answer, what would be required to achieve this?

Q17.2 - Based on your previous answer, what are the barriers to achieving this?

Q18 - Does multi-use public open space require cross-organisational agreements?

Yes

No

Q18.1 - Based on your previous answer, what would be required to achieve this?

Q18.2 - Based on your previous answer, what are the barriers to achieving this?

Semi-structured Interview Verbal Consent Script and Question Guide - July 2022

Part 1 - Consent

Do you agree to participate in the following semi-structured interview?

Do you consent to this conversation recorded for transcription and analysis purposes?

Have you read the Participant Information Sheet or has someone read it to you in a language that you understand? Do you confirm you understand the purposes, procedures and risks of the research as described in the Participant Information Sheet?

Have you had an opportunity to ask questions and are satisfied with the answers you have received?

Do you freely agree to participate in this research project as described and understand that you are free to withdraw at any time without it affecting your relationship with the researchers or the University of Technology Sydney?

Are you aware that you can contact the researcher Megan Taylor (megan.k.taylor@student.uts.edu.au) or her primary supervisor Heather MacDonald, academic in planning and Deputy Dean in the Faculty of Design, Architecture and Building at UTS (heather.macdonald@uts.edu.au) if you have any concerns about the research?

Part 2 - Introduction

In this interview, after asking some basics about your situation, you will be asked about the barriers and enablers to new local park provision that you perceive or experience within your jurisdiction. Topics will span several broad areas based on a previous component of this research regarding planning professionals' experiences and opinions on local park provision. You will likely be asked about park design, developer contributions, and cross departmental collaboration opportunities regarding local park provision within your jurisdiction. Questions will relate to alternative park design and the responses therein, uses of public open space,

developer contributions and funding mechanisms, local park maintenance budgetary allocations, strengthening inter-departmental collaborations, and other local park provision considerations.

Your responses to these questions will be analysed and the results will inform part of the findings and discussion chapters of my thesis. Just to reiterate, your personal data will not be shared with other participants. Your responses will be used anonymously within the data collation and distribution process, and you can skip any questions you are not comfortable with, although it is hoped that all questions will be answered to the best of your knowledge to help ensure the rigor and value of the data findings. Your data will be stored according to Australian privacy information standards, as outlined in previous correspondence. Once again, thank you for your time, consideration and resources regarding your participation in my research.

After Consent

Please answer all questions based on your professional experience. Most questions ask about your current agency or jurisdiction. If you prefer to base your answer on a previous position (or experience in several positions) please note this in your answer.

For each question, please choose the option most applicable to your jurisdiction or professional situation. For example, some jurisdictions only have redeveloping (brownfield) areas, while others include a combination of developing (greenfield) and redeveloping (brownfield) areas. Comparisons between greenfield and brownfield sites are only needed when your jurisdiction includes both types of sites.

For the purposes of this survey, a local park refers to a public open space specifically set aside for passive recreation. This may include several if not all of the following amenity or attributes: green vegetation, grass, landscaping, children's play equipment and/or adult exercise equipment, water features/water play, taps, bubblers, toilets, seating, lighting and/or footpaths, fencing and/or rubbish bins, sized between 0.05 and 5 hectares. Note, these amenity/attributes are a guide only. For example, if your jurisdiction predominantly handles larger parcels of land, please make a note of this in your answer.

Other public open space definitions used within this interview are provided immediately before their respective questions.

Part 3 - Warm Up Questions

Q1 - Who do you work for?

• NSW LGA (1)

• NSW State Government Agency (2)

(Skip to q4 if participant answers SGA)

Q2 - How do you classify your LGA?

• Developing (greenfield) area (1)

• Redeveloping (brownfield) area (2)

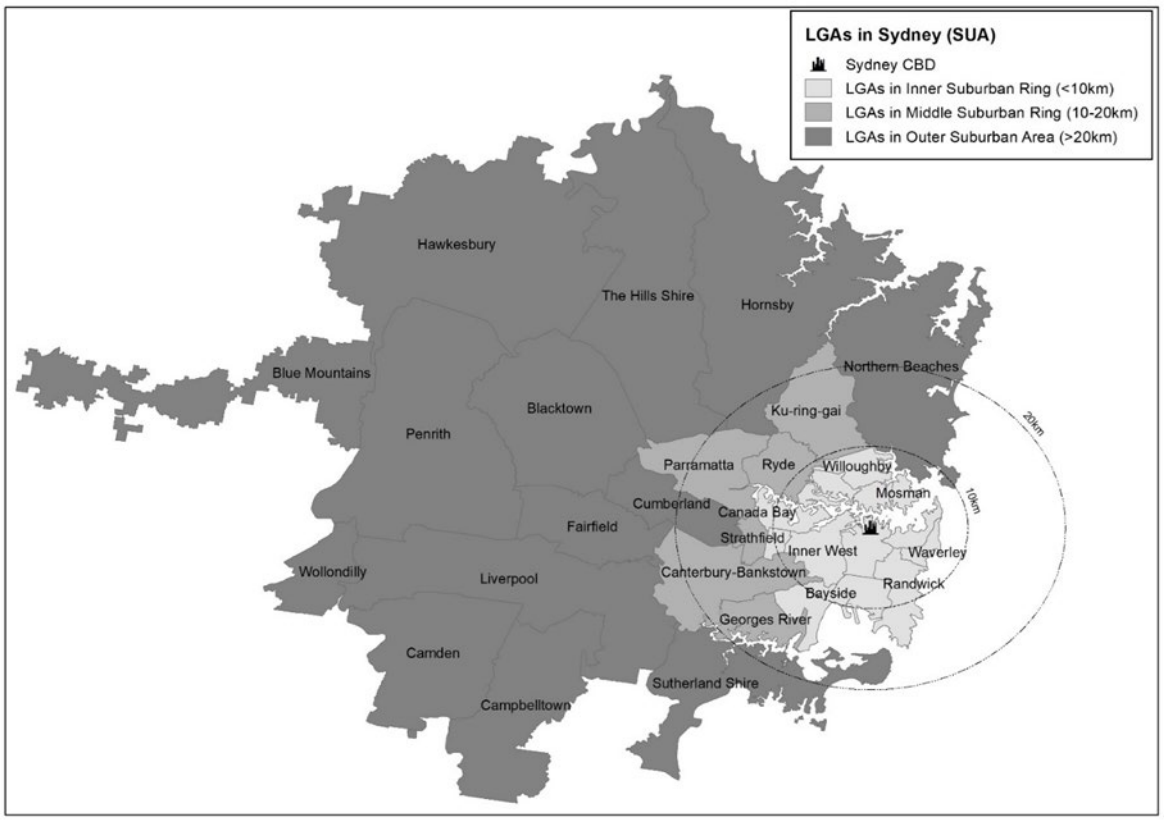
• Both developing (greenfield) and redeveloping (brownfield) area (3)

Q3 - Where is your LGA predominantly located? (face to face only - based on below graphic – show participant)

• Inner suburban ring (1)

• Middle suburban ring (2)

• Outer suburban ring (3)



Source: Author.

Q4 - How long have you been working in the planning/relevant profession/industry/sector for?

• 0 - 5 years (1)

• 6 - 10 years (2)

• 11 - more years (3)

Part 4

Questions are grouped thematically and are a guide only.

Influences on New Local Park Provision – Basics

What is the most significant barrier to new urban park provision within your jurisdiction?

What is the most significant enabler to new urban park provision within your jurisdiction?

What is one thing that could improve urban park provision within your jurisdiction?

COVID19 and Local Park Provision – Basics

Has the advent of COVID-19 changed how new urban park priorities are ranked in your LGA/jurisdiction?

If = yes How and why have priorities changed?

If = no Based on your previous answer, is this satisfactory or would you like to see changes?

Managing Planning Priorities

How well are state/metropolitan strategic priorities engaged with in a local planning context?

How is future open space provision planned for in your jurisdiction or agency?

Developer Contributions – Basics to In-Depth

Are Developer Contribution requirements adequate for urban park provision in redeveloping (brownfield) and/or developing (greenfield) areas?

Are Voluntary Planning Agreements more effective than Developer Contribution requirements for providing new urban parks in developing/redeveloping areas?

A theme which came through the first round of Delphi responses was the inadequacy of developer contributions for local park provision in both developing (greenfield) and redeveloping (brownfield) areas. Whilst voluntary developer agreements were a preferred type of contribution, because they were somewhat more flexible in their approach and implementation, ultimately, they too come with challenges. Considering the relative merits of in-lieu contributions towards park provision on a yet-to-be-identified site, versus negotiated contributions of an actual space, with less reliable standards of park provision…

In your opinion, is one of these options less flawed than the other?

Given the VPA is a negotiated outcome, could consent authorities strengthen their negotiating position to improve park quality outcomes?

Local Park Provision and Densification

A reoccurring theme which came through the Delphi study related to the exorbitant land costs, and a scarcity of land availability, and the challenges therein for new local park provision, particularly in redeveloping (brownfield) areas. These are areas that are anticipated if not already densely populated, relational to benchmarked local park provision guidelines, and are only likely to increase in densification in the future.

It was suggested in the responses that while benchmark standards for local park provision are useful in the early stages statutory planning authority documents, they are impossible to implement using traditional modes of urban park provision. What are your thoughts on this?

Are there alternative means of local park provision that go beyond the traditional measurement of per capita that you would like to see implemented within your jurisdiction?

A smart park concept is defined as a park that uses smart digital or physical technologies, and/or innovative materials from the early stages in the planning process through to the ongoing of the park, to improve the efficiency, functionality, use, safety, and sustainability of the space and by extension immediate surrounds.

A parklet is defined as, a temporary pop-up or fixed park located within the average width/depth of a car parking space or transport right of way, that has been converted into a small recreational space, often with some form of vegetation and possible seating option in order to make it person centric rather than vehicle centric. They are often created as a means of improving streetscapes, social connectedness, pedestrianism or foot traffic for local economy, urban amenity and other micro-environmental benefits.

A rooftop park sometimes referred to as a sky park or rooftop garden is a form of ‘semi-intense’ or ‘intense’ green roof. As it its name suggests, it is a park located on top of a building or structure, publicly accessible from the street. It contains vegetation, irrigation, seating, lighting, potentially play equipment and other simple amenity for use by the public.

Given the cost and scarcity of suitable land for local parks, are alternative design approaches (such as but not limited to, smart parks, rooftop parks, or parklets) a viable solution within your jurisdiction?

Has your organisation explored these ideas in principle?

Building on the previous Delphi questionnaire, and the responses therein, particularly in developed areas, and the push toward higher densification, particularly along transport corridors and in major precincts and urban hubs:

In your opinion, what can be learned about traditional and alternative local park provision from other more highly densified cities around the world such as London, Singapore, Tokyo, New York and Toronto?

What are the solutions or items which require further consideration regarding new local park provision regarding urban densification within your jurisdiction?

Funding Mechanisms for Local Park Provision

A secondary theme of the developer contributions debate, which came through the first round of Delphi responses extended to funding priorities and competition from other strategic urban goods. The majority of participants agreed that available funds for new park development were inadequate, and that this indicated park space is a lower priority than other elements of urban infrastructure.

In your opinion should political priorities and by extension funding priorities/mechanisms shift regarding the proven and often well touted benefits of local park provision as an amenity protecting the urban health of the city?

In your opinion, as a planner who works at the intersection of policy and practice, what could alternative funding priorities for local park provision look like?

In your opinion, what will happen if local park provision is not taken more seriously as an urban amenity as expressed through political priority and by extension funding priorities?

Delving deeper into the themes regarding funding mechanisms for local park provision, and turning your attention to the often-under-considered topic of local park ongoing running costs and maintenance outside of the planning profession:

Given that local park maintenance falls to local council, and council rates contribute to this amenity cost, and differing jurisdictions have different budgetary allocations for local park provision based on the collection of council rates… In your opinion, is this a fair way to allocate costs for the upkeep of local parks, when obviously some councils have more than others, but local park provision is essential to the health of every jurisdiction?

How does your jurisdiction measure the success of new local park provision?

Interdepartmental Collaboration

Another theme which came through the Delphi responses related to the under-use of existing public open space (but not necessarily under-use of park space), and a desire to see public open space used more effectively and collaboratively for the public benefit, thereby easing the pressures put on local park usage and provision.

Note: for the purposes of this research, and the questions within this interview, public open space is any greenspace open to the public, either temporarily or permanently for either active or passive recreation purposes that is not considered private residential greenspace, or is not a plaza, footpath, concourse, road or mall.

What alternative uses of existing public open space would you like to see within your jurisdiction?

How could existing public open space be used more effectively within your jurisdiction?

How could existing public open space be leveraged within your jurisdiction for greater economic benefit?

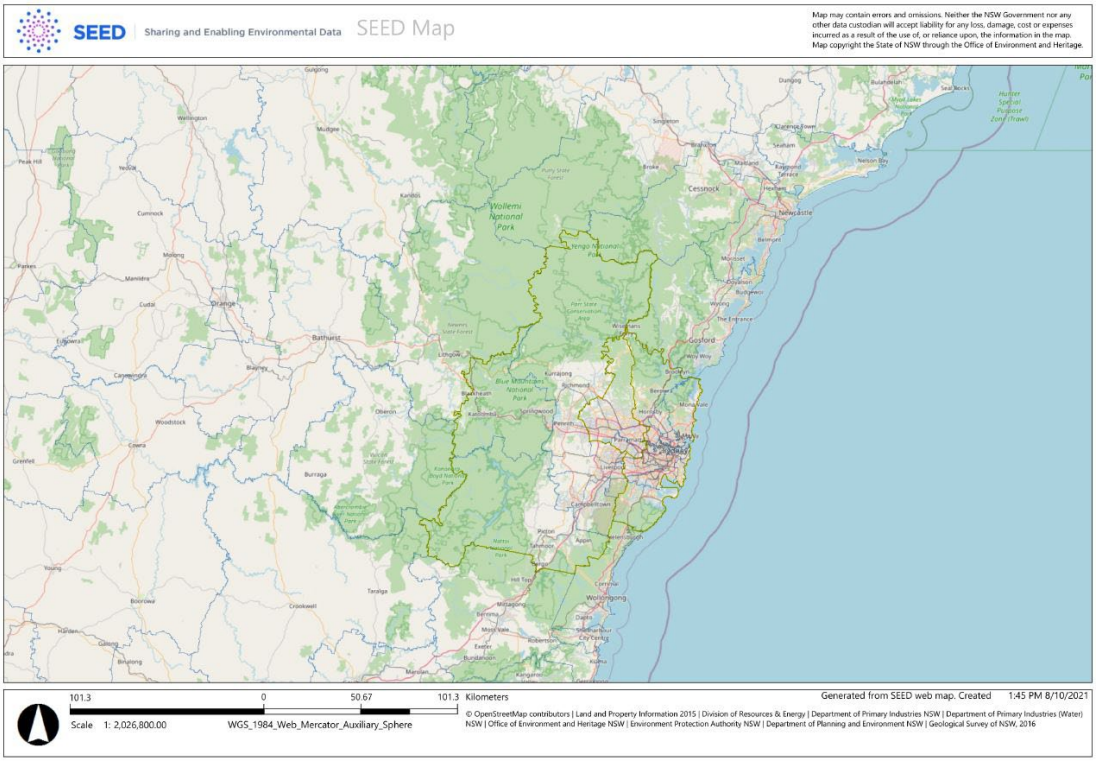
How could the use or function of existing public open space be strengthened in relation to local park provision?

a. Given innovative uses of local parks involve shared function, use, and management, what are barriers to effective cross-departmental relationships?

b. What could be put in place to improve these relationships?

Appendix C: 5 districts with LGAs SEED map and 3 cities highlighted

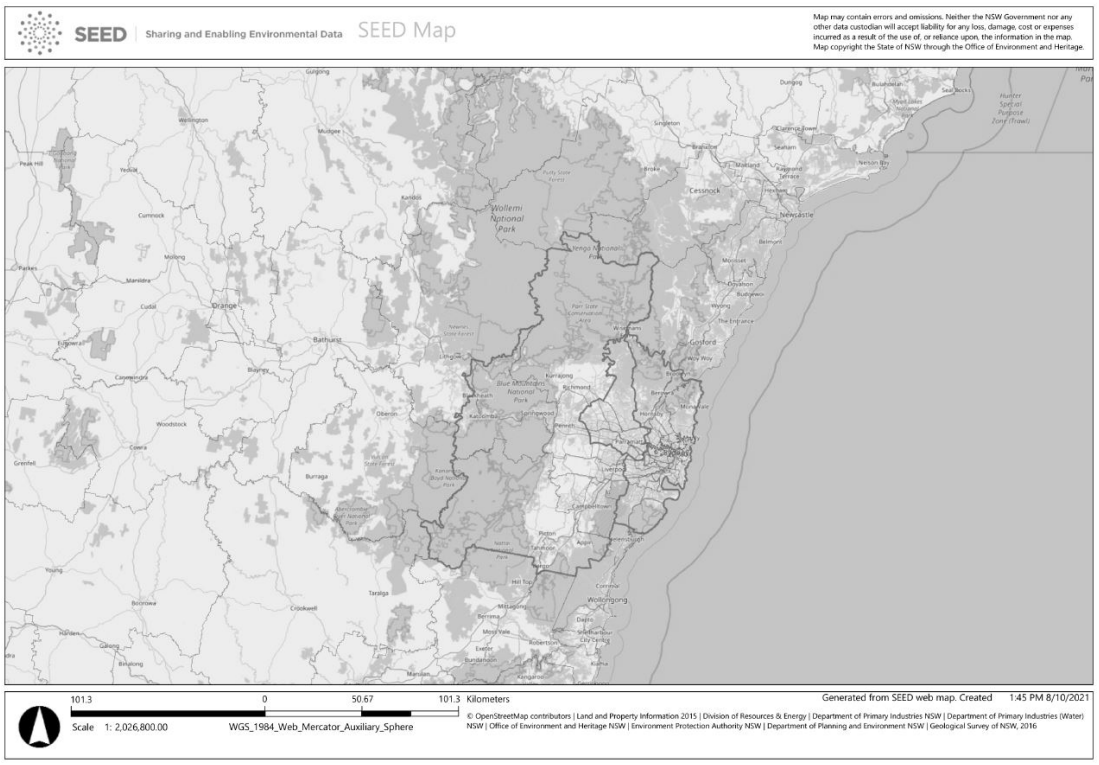
Figure C1
SEED Map of LGAs, 5 districts, and 3 cities highlighted.



Source: NSW Government (n.d.-b).

Figure description: Figure C1 is a SEED map showing the borders of the five districts of Greater Sydney (Western City, Central City, Eastern City, North District, and South District). The map also shows the borders of LGAs in New South Wales. The borders of the three cities (Western City, Central City, and Eastern City) are highlighted in yellow.

Figure C2
SEED Map of LGAs, 5 districts, and 3 cities highlighted.



Source: NSW Government (n.d.-b).

[1] Chapters are referred to by their numerical value within this thesis. Single chapters are assigned a capital “C”, and where chapters are plural, they are assigned a lower case “c”. Similarly, a single section is assigned a capital “S” and if sections are referred to as plural, they are referred to as lower case “s”. Sections are further referred to using a numerical value and then the title of the section in quotation marks.

When the phrase “above” or “below” is used, it denotes to an item within the current chapter. When the phrase “previously” is used, this is context specific and can either refer to an item in the current chapter, or more likely an item situated in a previous chapter.

[2] Olympic Park

[3] In this instance, a participant may also refer to a person that engages with the results of the research.

[4] Sydney is not the capital of Australia. That title belongs to Canberra; a small city located in the Australian Capital Territory. Sydney is the capital of the state of New South Wales and is the largest city in Australia.

[5] Changes in yearly boundary shifts are negligible

[6] This thesis was written between 2019 and 2024. For the purposes of this research, Recent history is from the turn of the 21st century.

[7] For an overview on the Australian political system, see the Parliamentary Education Office (2020, May 19).

[8] As P. Burton (2017) explains, the Australian Bureau of Statistics (ABS) do not recognise the definition of a ‘metropolitan area’ (or non-metropolitan areas). In practice, they are similar to either a Significant Urban Area (SUA) or in some cases a Greater Capital City Statistical Area.

[9] Unless otherwise stated, the references in this thesis to the state government, and any state government agencies, including the Office of Local Government (OLG), the former Department of Planning and Environment (DPE), and others refer to NSW.

The Department of Planning and Environment NSW (DPE) has gone through several iterations since early 2019. From April 2019 – December 2021, it was formerly known as the Department of Planning, Industry and Environment NSW (DPIE), before returning to the pre-2019 iteration of the DPE. Between December 2021 and December 2023, it remained formerly as the DPE NSW. As of January 2024, the former DPE was disbanded and at the time of writing (May 2024) is known as the Department of Planning, Housing, and Infrastructure NSW (DPHI).

The abbreviation of DPE is frequently used within this thesis as it was the NSW state government preference and industry shorthand throughout the primary data collection timeframe of late 2021 and throughout 2022. The terms DPIE and DPHI are also used interchangeably throughout this thesis where appropriate.

Changes of government department names and hierarchy frequently occur when there is a change in government or a shift in the political landscape. These changes affect their correspondence, websites, publications and scope. There are often discrepancies between the department's name and the authorship or copyright provided on websites, publications, or secondary sources depending on the time of initial access, citation and final reading.

Where possible, the former DPE government websites are provided using the most up to date copyright attribution (DPHI) as of May 2024. In multiple instances, NSW state government policy documents referenced within this thesis have since been unpublished from the internet.

Where possible, secondary data sets have been updated to reflect 2024 copyright attribution. Where this is not possible or warranted, original copyright attribution remains.

Furthermore, unless otherwise stated, any reference to a LGA or local council refers to Sydney. For the purposes of this research, the term ‘local council’ is used to indicate the local government organisation that runs and represents its respective LGA; local councils in NSW are independent, locally elected corporate bodies. Whereas a LGA per se refers to a spatial jurisdiction within its boundary.

[10] The definitions of a local park, smart park, rooftop park and parklet are those which were also provided to participants in the Delphi study and the semi-structured interviews.

[11] This was also the case in NSW as evidenced by various policies and ministerial orders put in place throughout the pandemic (DPHI NSW, 2024c).

[12] Data definitions provided by the Office of Local Government are based on 2020-2021 data as provided to and by the Office of Local Government. It is presumed these definitions did not change for the 2021-2022 reporting period, as no further information is provided (OLG NSW, 2021a).

[13] Italics have been used throughout the body text in this thesis in accordance with APA7 guidelines in accordance with traditional academic convention. Where possible italicised text has been narratively framed in such a way to imply that the phrase is of significance as not to disadvantage people who rely on screen reader technology.

[14] Where acronyms are used in the thesis, they are assumed to be so familiar that they are imbedded in the Australian lexicon. The two most commonly used acronyms used in this work are: 1)

ABS Australian Bureau of Statistics; 2) LGA, local government area. Where policy documents have been shortened, they are explicitly labelled as “hereby referred to”.

[15] Long form narrative descriptions are not repeated for greyscale maps or figures.

[16] Excluding tables whereby italics are foregone to improve data presentation and readability.

[17] The three most common secondary dataset or document titles used within the narrative descriptions are: 1) “A Metropolis of Three Cities” (GSC, 2018b); 2) “Time series data 2020-2021” (OLG NSW, 2024b); 3) “2022 NSW Common Planning Assumption Projections for year ending 30 June” (DPIE NSW, 2020).

[18] JO in the diagram is short for joint organisation

[19] The TFNSW “Future transport strategy” is a living document.

[20] The “State Infrastructure Strategy” is a living document which is updated annually.

[21] An 11th objective related to ongoing progress reporting has since been added to the GCC reporting mechanisms.

[22] Administered by local councils.

[23] During the primary data collection phase of this research that took place between late 2021 and late 2022, the majority of NSW state funding for open space provision across Sydney came from the NSW Department of Planning and Environment (DPE). As noted previously, at the time of writing (May 2024), the NSW DPE had been reconfigured and subsequently renamed the NSW Department of Planning, Housing and Infrastructure (DPHI).

[24] Public private partnerships for park provision are rare compared to developer contributions and state government grants, thus they have not been included as part of this research.

[25] Amounts are in Australian $.

[26] How developer contributions are specifically spent on open space on an LGA level was beyond the scope of this research. This information is frequently considered confidential or sensitive and it was not possible to ascertain these figures.

[27] How active spaces are funded was beyond the scope of this research.

[28] The “Parks for People” citation uses a capital “L” owing to the possibility of a lower case “l” being visually mistaken for the numeral “1”. This is to say, (DPHI NSW, 2024L) as opposed to DPHI NSW, 2024l). Note that all other alpha-numeric references are lower case in accordance with APA convention.

[29] At the time of collating secondary data in October 2023, data was not available regarding the successful first round of project completions across Sydney. As a result, funding allocations could not be included in this research.

[30] According to the TFNSW, at the time of writing (May 2024), the second round of grant funding for the “Share our Streets Program” was acquitted in 2024 (TFNSW, 2024b).

[31] Note the Sydney Metropolitan area as defined by this research in Section 1.4.3 “Definition of a metropolitan area” is smaller than the Greater Capital City area of Greater Sydney, which is why the figures are lower than those provided by the ABS (ABS, 2021a) above.

[32] When using population data provided by the OLG, results would be slightly different due to annual reporting periods as compared to population data from the DPIE which, is based on 5-yearly reporting frameworks taken directly from the ABS census data.

[33] Joint use arrangements are in place across Metropolitan Sydney.

[34] The NSW “Apartment Design Guide” as of May 2024, the time of writing this thesis, is located on the NSW planning website (DPHI NSW, 2024a).