

How do Master Planners Think? A Sociomaterial Inquiry

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ABSTRACT

This thesis is an inquiry into master planning culture in everyday practice. It asks how master planners collectively make sense of and achieve complex tasks, or more to the point, how do planners think? Attending to *how* planners think rather than *what* they think about, shifts the discussion away from urban matters and design decisions, towards the study of cultures of practice. Drawing from a distributed cognition approach, the study is concerned with the sociomaterial basis of thought, wherein people, materials, their spatial environments and temporal perceptions are entangled in an emerging cultural system.

Over the course of eight months of participant observation and 38 ethnographic interviews, the study followed the making of three planning artefacts – a model, drawing and report – to consider their performative roles in sociomaterial arrangements and perceptions of time and space. In the making of boundary objects, the teams of planners internalize the boundaries of the task enacting contingent relationships with others and enfolding agential properties of uncertainties into coordinated practices. The findings show that planners do not try to avoid uncertainty but think through modes of adapting and attending to it, generating temporary contexts of confidence.

On the basis of these findings and the method of inquiry, I outline three contributions this thesis makes to planning practice literature: it proposes a method of addressing the internal coordination of teams of planners and their cognitive complexities, rarely addressed in the literature; it focuses on an observable unit of study, which enables the analysis of the uncertain, ambiguous and absent dimensions entangled in planning thought; and lastly, it renders the concept of a planning culture amenable to reflexive conceptions of everyday practice. This approach provides insights into the multiple ways in which master planners conceive of and enact the ecology of planning in which they are embedded.

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LIST OF ABBREVIATIONS

ANT	Actor Network Theory
ARA	Actor Relational Approach
AA	Architectural Association
BIM	Building information modelling
CAD	Computer Aided Design
CDA	Confidential Disclosure Agreement
CGI	Computer Generated Image
CLG	Communities & Local Government
FAR	Floor Area Ratios
MET	Material engagement theory
MIT	Massachusetts Institute of Technology
NDA	Non-Disclosure Agreement
NPPF	National Planning Policy Framework
OMA	Office for Metropolitan Architecture
RIBA	Royal Institute of British Architects
RTPI	Royal Town Planning Institute
STS	Science and Technology Studies

CHAPTER 1: INTRODUCTION

The master plan is dead. Long live the master plan.

Cuff and Sherman 2011, 19

Uneasy spaces of master planning practices¹

The term ‘master plan’ often invokes an image of a top-down device used by state powers to control urban development. The unease or aggravation associated with master plans relates to their association with processes that generate sweeping changes manifesting authority upon land and society. In Britain, public bodies often avoid calling their plans master plans, opting for more subtle names: the plan for the Olympic site development following the 2012 Games, for example, had initially been called the Legacy Masterplan Framework and was later rebranded as the Legacy Communities Scheme (Firley and Groen 2014).² Critical planning theory and its contemporary branches have also rejected the master plan tool, relegating it to the margins of its debates, leaving only a few theorists and practitioners to engage in discourse, develop theory and teach master planning practices (Bullivant 2012; Sanyal 2008). Today there is no widely accepted definition of master planning – let alone of planning more broadly, though its literature is vast³ – and as one planner explained during my fieldwork, ‘we think we know what a master plan looks like,

¹ Taken from Appadurai (2013, 266), ‘planning, as a field, is an uneasy space’.

² How the term is used often relates to the principles and ideological foundations of national planning systems and their histories (Firley and Groen 2014). Note also that different authors will write ‘master plan’ or ‘masterplan’, both being acceptable versions across academic literature and official planning documents.

³ See Allmendinger (2009); Steinø (2003) and Tewdwr-Jones, Phelps, and Freestone (2013); Watson (2008) for further discussion. An overview of reasons for planning’s lack of definition as a discipline will be presented in Chapter 2.

but it's just an unhelpful term, because it means a lot of different things to lots of different people' (see Figure 1.1).

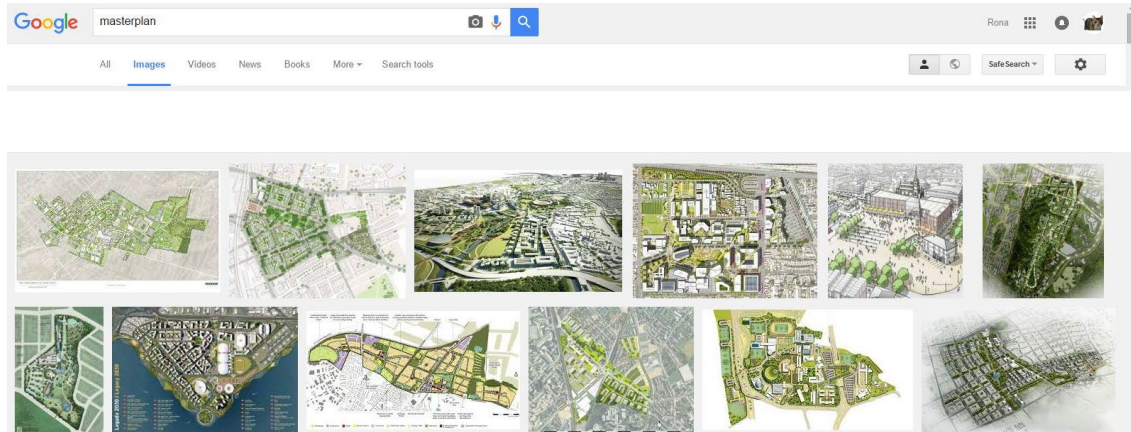


Figure 1.1: Screenshot of an online search for images of master plans
Source: Author's search on www.google.com

The lack of critical attention is significant because master planning is widely practised.⁴ Planners, among them master planners, face a variety of challenges in trying to guide the development of the built environment while responding to massive changes. With the intractability of urban problems - among them inequities, vulnerabilities, ecological survival, the protection of cultures and diversity, economic and political shifts - planning practitioners find themselves engaged in persistent and inherently political processes of mitigation (Rittel and Webber 1973). As Cuff and Sherman (2011, 14) explain, they work in an urban environment that 'intrinsically demands design, yet inherently resists it'. The

⁴ Discussions on the role of professional planners, the significance of the practice of planning as a whole, and whether or not society is at all aided by planning, come under a category often described as substantive theories of planning (Allmendinger 2002b; Faludi 1973).

importance of discourse, reflection in practice and self-evaluation in planning is not merely rhetorical, but crucial if planners are to remain able to adapt and respond to challenges in the way that they make sense their world and intervene in it (Banai and Rapino 2009; Bullivant 2012; Lynch 1984; Sanyal 2014).

This thesis posits that, while master planning eludes a general definition, its meaning emerges in practice; as Taylor (2004, 92) states, 'if the understanding makes the practice possible it is also true that the practice largely carries the understanding'. I begin by proposing that planners participate in a shared framework through which they understand their practices, interpret what they do, how and why they do it. As Ryle (1949) proposed in *The Concept of Mind*, the act of thinking is not merely individual and private, but rather defined by those social and cultural dynamics outside the brain as dimensions of the human mind through behaviours, language and engagement with objects. This approach conceptualizes master planning practices as shared cognitive systems through which, 'in the process of making the whole business comprehensible, some perceptions are admitted, some rejected, and others combined or broken down' (Gross and Rayner 1985, 3).

This study is an exploration of planning culture as the social mediation of thought and perception shared by a community of practitioners (Friedmann 2005; Wenger and Lave 1991). It asks how master planners collectively make sense of and achieve

complex tasks. Or more to the point, how do planners think? To address this question, the research for this thesis is guided by the anthropological tradition of attending to social relations in practice through ethnographic research, questioning how people come to make sense of their world through shared systems of beliefs and values, through patterns of social organization, practices and artefacts, relating the tangible to the intangible, the visible to the invisible. It is based on eight months of participant observation research in two companies engaged in master planning in London, immersing myself in the formal and informal practices of the companies on a full-time basis, conducting 38 ethnographic interviews with most of the informants, and another two with planners working in another company.

While the ethnographic approach is inherently partial, incomplete, and written through acts of exclusion (Riles 2000), as any act of storytelling is, the aim of this thesis is not to provide a universal, comparative or critical view of master planning. Rather, its two main objectives lie in the form of inquiry. First, it hopes to reframe certain existing concepts in planning theory by engaging with particular anthropological insights, to contribute to planning theory and offer master planning practitioners and students an analytic framework through which to consider practice. Second, this thesis aspires to complement the extensive anthropological discourse on cities, planning and design practices by offering a view of master planning from within, which is missing from the literature to date. This builds on another extensive theoretical tradition of planning as a reflexive practice (Fischler 1995, 2012; Friedmann 1987; Howe and Langdon 2002; Schön 1983), and the study

of practitioners by planners and planning theorists (Forester 1996; Forester, Fischler, and Shmueli 2012; Krueckeberg 1983, 1993; Tewdwr-Jones, Phelps, and Freestone 2013). As an architect and master planner by profession, this study is in part, my reflection on my own practices, and on the community of practitioners with whom I am at home (Jackson 1987). Making practice so visible could only have been done with the support and desire for a reflexive practice that my informants and I shared.

The following section outlines an underlying framework through which this thesis approaches the study of thinking as a cultural practice. It lays out the theoretical foundations that guided the thesis, namely from anthropology and science and technology studies (STS), and from these draws out the research design - how I define the field, unit of analysis and writing focus (Gellner and Hirsch 2001). The sections below mark the beginnings of a theoretical engagement that will be elaborated through the rest of the thesis.

Thinking as a sociomaterial practice

In her book *Impossible Engineering: Technology and Territoriality on the Canal du Midi*, sociologist Chandra Mukerji's (2009) study offers a historian's view of the activity of planning as a phenomenon of collective intelligence in the Seventeenth Century. She unpacks the feat of engineering the Canal, which spans two hundred and forty kilometres, weaving through the South West of France and linking the

Atlantic to the Mediterranean. Though the ingenuity of the Canal is often attributed to the genius of one local entrepreneur, Pierre-Paul Riquet, Mukerji argues that this conception of genius as a single author of the project is misguided. She shows that the full scope of knowledge required to design the Canal was unavailable as any single design intelligence, and that its construction was the result of not only engineers and financiers among the educated elites, but the craft skills of local builders and knowledge of local farmers who understood the land, water bodies, and seasonal changes of the area. The collective intelligence constituted ways of combining formal and informal - or vernacular - knowledge for mapping, construction and hydraulics, and bringing together a diverse group of people, who did not always see eye to eye.

Her story reveals how planning and engineering documents can easily mislead in their inability to capture the complex sociomaterial relations and practices that made them. The images of plans and detailed designs hide the collaborative strategies and relationships mediated by landforms and historical remains as agents of memory and identity, actively negotiated in the activities of planning.

Meanwhile, water itself, meandering across the landscape appears passive and malleable to the plans, all the while becoming an agent of state power: its form and movement intervening in the futures of local traditions, undoing the existing organization of local life. While the conception of design as the coordination between designers, craftspeople and materials is not in itself a novel discussion,

particularly in architecture (Marchand 2001, 2009; Turnbull 1993), Mukerji demonstrates how this could work on the scale of regional planning.

Mukerji's historical account of Canal du Midi's planning and construction is based on anthropologist Edwin Hutchins's theory of distributed cognition (Hutchins 1995a, 2010; Hutchins and Klausen 1996). Hutchins argues that collective intelligence is not a delimited shared knowledge within a group of individuals (see Salomon 1997), but rather an emerging cultural system of cognitive processes that 'take place both inside and outside the minds of people', challenging the notion that an idea and the environment in which it emerges are two distinct phenomena (Hutchins 1995a, 354). This approach to cognition resonates with Durkheim's assertion that societies are irreducible to their constitutive parts, and that social life is not composed merely of individual thoughts, motivations and behaviour. For Durkheim, once individual consciences come together, the collective formed is constituted by its own laws that can only be explained in social terms. He asserted that the cognition of individuals acting in society does not originate from autonomous sources and that preferences, values and behaviour derive from social commitments (Durkheim 1951 [1897], 1964 [1893], 1982 [1895]).

Drawing from Durkheim, Mary Douglas's theories consider the social origins of thought through systems of meaning patterned in social cognition. In her book,

How Institutions Think (Douglas 1986), she reasoned that institutions⁵ develop social organization and ritual practices that advance certain styles of thought, which in turn reiterate their processes. She proposed that there exists a relationship between a community's social organization and its patterns of beliefs and values. Douglas rejected determinism, and considered that differences in conventions through which individuals understand the world, coordinate their actions and make choices toward or against mutual benefit, develop systems of oral, behavioural and material signals, all relate to the social arrangements of which they are a part (Douglas 1970, 1978, 1986, 2006; Grendstad, Selle, and Thompson 2003; Patel and Rayner 2012; Rayner 1982; Tansey and Rayner 2009; Thompson, Ellis, and Wildavsky 1990; Thompson and Verweij 2004). For Douglas, culture is the variable of study and relates to ways in which people live together or are bound together as a social solidarity, a group framed by three complementary and distinct features: social relationships (structure), cultural bias (ideas) and behavioural strategy. Each one of these provides a lens through which culture can be reflected upon, justified and manifested throughout the solidarity, though none is causally prior or reducible to the others (Grendstad et al. 2003).

Douglas also draws from Fleck's (1981 [1935]) work, *Genesis and Development of Scientific Fact*, in which he explored scientists at work and knowledge production.

⁵ Douglas uses the term institution to reflect any 'form of legitimized social grouping', requiring a 'parallel cognitive convention to sustain it' (Douglas 1986, 46; see 6 and Richards (2017) particularly Chapter 3, for a discussion on Douglas's use of the term).

He notes that in practice, scientists develop shared meaning within their thought collectives and that the shared assumptions on which scientific practices are founded often remain invisible to practitioners and are therefore rarely questioned. Inspired by the ideas of Durkheim and Fleck, Douglas regards how collective rationalities explain the social and material categories that permeate all forms of experience – including our understandings and classifications of food, art, home and our bodies - that are rich with implicit meanings. She considered it the task of anthropologists to identify relationships between the social environment, practice, behaviours and beliefs, and to notice the analogous patterns engrained in what may seem arbitrary. Douglas (1986, 45) states that '[h]alf our task is to demonstrate [the] cognitive process at the foundation of social order. The other half of our task is to demonstrate that the individual's most elementary cognitive process depends on social institutions'. Institutions are not a passive context for social activity; rather they cultivate systems of meaning, classification, identity, and do the work of selecting (such as remembering and forgetting). Social interactions with the material world constitute and enact institutional arrangements, or perhaps, as Daniel Miller (1998, 17) would later argue in his study of material culture, 'the social is as much constituted by materiality as the other way around'.

Hutchins's distributed cognition also establishes the social and material basis of thought and perception. His theory is based on the idea of cognition as a cultural system, rejecting the more traditional views of cognitive anthropology that focused on individuals and the knowledge they required to be an accepted member of a

culture (D'Andrade 1995). His approach, based mostly on Vygotsky's (1978 [ca.1930-1934]) *Mind in Society* and Minsky's (1985) *Society of Mind*,⁶ does not deny that individuals possess the capacity to think on their own, but argues that there is value in studying how cognition takes place within groups, particularly in situations of collaborative practices. Hutchins and others who adopt a distributed cognition framework argue that cognitive outcomes – such as decisions, category assignments, inferences, etc., - are not achieved in isolation, but are mediated within a distributed cognitive system including other people, objects, patterns and events. Through the coordinated elements of a cultural system, cognition is not divided between separate entities or stretched over an organized setting homogeneously, but rather distributed across multiple and simultaneous socio-material interactions (Lave 1988).

Cultural practices are constituted through the coordinated elements of a cognitive system (Hutchins 1995a, 2008). By Hutchins's accounts, practices are coordinated social, material, temporal and spatial arrangements in a context of culturally shared goals. Culture understood in this way is not a static object or a container of shared meanings, but evolving practices and relationships. Individuals may appropriate certain elements of cultural practices, but only once they have stemmed and

⁶ The idea relates to earlier works that situated activity in certain forms of a shared world (Heidegger 1996 [1927]; Husserl 1989 [1936]; Marx 1976 [1867]; Schutz 1967; Vygotsky 1978 [ca.1930-1934]), and those that locate relate cognition to a social environment (Dourish 2004; Garfinkel 1967; Nardi 1996; Resnick, Levine, and Teasley 1991; Schön 1983; Shumar and Renninger 2002; Suchman 1987; Wenger and Lave 1991; Zerubavel 1997, 2015). See Stahl (2002, 2006, 2017) for discussion.

evolved from the wider system. The origins of the complexities of cultural processes are located within a cognitive ecology and distributed in three ways: between people, their material environment, and through time and space (Zhang and Patel 2006). The following three sub-sections are dedicated to exploring the significance of distributed cognition for this thesis, through these three dimensions.

Planners in practice

Hutchins defines a cognitive system by the social and material interactions arranged for the purpose of accomplishing a shared goal. His approach to cognition focuses on practices aimed at a specific end, tracing how the completion of tasks is achieved by distributed systems, interrelating minds, behaviours, artefacts and the arrangement of physical space, as constitutive elements. In his study of navigation practices aboard a navy ship, Hutchins traces methods and social organization through different cognitive events, or smaller sociomaterial systems 'delimited by the functional relationships among the elements that participate in it, rather than by the spatial colocation of the elements' (Hollan, Hutchins, and Kirsh 2000, 175). He sets out to demonstrate that people make the environments in which they are able to generate and exercise their cognitive abilities as both individual and social processes. Distributed cognition does not assume boundaries around its unit of analysis a priori but rather considers a system that has the capacity to configure itself (Hutchins 2010a).

Studies of distributed cognitive systems are based largely on ethnographic methods, making it possible for researchers to note particular sociomaterial relationships in everyday practice (Hollan, Hutchins and Kirsh 2000). Suchman (1987, 179) considers the social and material conditions that make practice possible as situated action, 'an emergent property of moment-by-moment interactions between actors, and between actors and the environments of their actions'. Any study of situated action, therefore, requires the observer to attend to the flux of activity and to consider its spontaneity (Lave 1988). Schatzki (2001, 3), a key thinker in practice theory, goes further to say that 'the social is a field of embodied materially interwoven practices centrally organized around shared practical understandings', and that both actions and materials are constituted within practice.

It follows that actions and practices are best understood within their contexts, by means of ethnographic study to explore the arrangements of work (Hammersley and Atkinson 1995; Postill 2010). There is now a tradition of locating research within organizations across the anthropology of work (Gellner and Hirsch 2001) and laboratory ethnographies in STS (Hess 2001; see Knorr Cetina (1995) for a review of the literature development). Latour and Woolgar (1979, 27), in their seminal work *Laboratory Life: The Cultural Approach to the Study of Science*, employ a perspective of the 'anthropologist of science' wherein they examine everyday practices of

scientists as a strange and distant culture⁷ to consider how new facts and phenomena come about, and how knowledge is developed. Their work serves as a guiding resource in considering the techniques, tools and concepts for research within the interior spaces of practice, looking both at routine and exceptional cases of coordination, exploring the unconscious dynamics. More recently, Farias and Wilkie (2016) consider creative practices in their book *Studio Studies: Operations, Topologies & Displacements*, to follow the production of cultural artefacts. The studios as sites of production not only situate practice within a spatial and temporal context but are themselves emergent; context is not purely an outer container or shell inside of which people behave in certain ways but is constituted and enacted in everyday activities.

For the purpose of this research, studying the practices of master planners entails identifying and entering the organizations where they work. In her research on planners in the Netherlands, Grijzen (2010, ii) noted that to her surprise, planners ‘were much harder to find than [she] had expected’. Though she had anticipated finding the traditional planner in the role of a government official, she encountered planners mostly as private consultants, coming from a variety of backgrounds, and providing short-term outsourced work. While private practitioners led the history of

⁷ Knorr's (1977) work focused on understanding the work of scientists as they do, to study how scientific knowledge is made.

planning in the United States from the early days of the discipline,⁸ in Europe this trend has been relatively new. A growing number of private consultants, including urban planners, designers, architects, landscape architects and engineers now undertake core public planning responsibilities that have been outsourced by a public sector struggling to adjust to ongoing reform (Minnery 2007), and planners now are often called upon to incorporate previously distinct and sometimes oppositional roles, in 'diverse, if typically highly uneven ways' (Healey 2006b, 17).

Through the 1990s, capitalist market thinking, particularly in the Anglo-American context has added to the difficulties of outlining the place and role of the master plan. Transformations in administrative and political systems have altered the role of planning in the public domain, changing its purview and political charge; shifting from urban government to governance has seen the public sector extended to incorporate private and community sectors in policy formulation and implementation (Dear 2000). The speculative scope of urban property markets and the rising demand for urban living have made the master plan a tool for private, public and third-sector entities as they engage with one another, each negotiating its rights and interests. Earlier categories of space – residential, work, commercial – have been undone as distinct functional zones in urban centres. The distinction

⁸ Famous urban planners working in the private sector in the United States in the early 20th Century include Daniel Burnham's and Edward H. Bennett who prepared the 1909 Plan of Chicago, and Harland Bartholomew Associates Inc.'s known for producing multiple comprehensive plans for Memphis, Newark, New Jersey and Columbus, and Ohio, among others.

between public and private spaces are increasingly blurred, with more private entities investing in, owning and maintaining (semi-)public spaces, commercial and residential large-scale developments (Minton 2012).

In the British planning system, this plays out in a rather particular way, based on a discursive approach in which the goal is to arrive at a shared vision between a range of stakeholders who may or may not have conflicting ideas (Healey 1983).^{9 10} It is not surprising, therefore, that much of planning research and theory focuses on those complex processes that bring together different stakeholders (Allmendinger and Haughton 2009; Freestone 2012; Holgersen 2015; Kim 2012; Nadin 2007) and on how planners talk about their practices (Forester 1985, 1996; Matthews and Satsangi 2007; Perin 1977; Watson 2008), leaving a significant gap in the literature; little research is dedicated to the internal practices of teams of planners as they

⁹ Both the planning companies that I studied were working on projects in and outside of the United Kingdom. Being in London, they had the commercial advantages provided by a world city, and their clients, including private developers and governments, were dotted around the globe. I found that their approaches to practice often related to the British planning system, something that will be explored further in the ethnographic chapters.

¹⁰ In some countries, planning law and regulation states that the plan is definitive and strict when it comes to its relationship with land, and that any development will have to conform with the scheme it sets out in order to go ahead. In Britain, however, Development Plans issued by local governments are set out as visions, policies, and procedural tools: written frameworks through which to evaluate future planning applications with a set of recommended desirable actions (Hague 2000). This means that every proposal for particular sites will be judged against policies, and that the controls that the policies lay out must be sensitive to the investment decisions of the private sector if they are to be followed through. When developers apply for planning permission, their plans reveal how they (re)interpret or negotiate the terms of the written development plan for the area, entering them into a discussion with planning officials.

actively define master planning in their everyday practices within private organizations (Hoch 1994; Rodwin and Bishwapriya 2000; Watson 2002, 2003).¹¹

Locating the study of situated practices inside organizations helps to outline both the physical field site and to define the group practitioners I observed. I take planners to be those who engage in the collective practices of making master plans (Becker 1974; Mandelbaum 1990). While their backgrounds may be diverse – architecture, engineering, geographers, landscape and urban designers, administrative planners, model makers, marketing consultants, researchers, etc., - only when I find specific differences in practice do I differentiate between them. As Friedmann (2005) noted, despite the variations between who planners are and what planners do, there is at the core a community of practitioners who carry out the work.

The things planners make

As discussed, a key dimension of the distributed cognition approach is the inclusion of all objects - human and nonhuman - in the cognitive system. Practices are always relational and mediated by artefacts (Blackler 1995; Carlile, Nicolini, and Langley 2013; Cook and Brown 1999; Wenger 2000 [1998]; Wenger and Lave 1991). Often, planning research begins with a final artefact and studies it backwards to

¹¹ Chapter 2 explores planning scholarship and contextualizes this thesis more specifically.

understand how it was made, tracing its successes and failures (Bullivant 2012; Ferguson 2006; Li 2005; Scott 1998; Talen 1997; Weszkalnys 2010). Perhaps this is an inherent part of planning as a discipline overall, as it is teleologically driven, where significance for practice and product are found in their final outcomes when they materialize in the built environment (Verma 1993, 1995). There is also a sense that, in being an applied discipline, every study must be evaluative and normative, to generate discussions on how to improve practice (Beauregard 2005; Flyvbjerg 1996; Holgersen 2015; Howe 1990). However, looking at final plans and their manifestations backwards may generate critical blind spots as master plans are opaque and do not reveal processes; almost like the difference between a drawing and a painting – the former shows the process of the artist’s hand, while seeing the latter, we can only assume what the artist did (Berger 1953; Ingold 2010b) (see Figure 1.2).



Figure 1.2: *The Virgin and Child with St. Anne*, by Leonardo da Vinci

Left: One of many studies by the artist for the painting, showing the movements of the artist's hand as he worked, revealing some of his processes, including changing the aspect of the image in the final work. *Right:* The final painting of the same subject, showing only a completed artefact, with the material opacity of the medium hiding the artist's process.

Source: <https://principlearttalk.com/tag/leonardo-da-vinci/>

As another analogy, Low and Lawrence-Zúñiga (2003, 305) describe an 'illusory transparency of space as it conceals the contradictions of its social production', and I argue that the same can be said of master plans. Reading only final outcomes backwards can interfere with the understanding of the multiplicity of practices.

In this thesis, I read practices forwards (Ingold 2010b), following planners as they work towards shared goals. In setting out to research how planning teams think about urban futures in their objectives, I originally assumed that I would delve into

intangible concepts and values of imagined spaces and that my own task would be to relate them to tangible manifestations of planning. In the years I had worked as a master planner, I considered my work to be that of imagining futures, designing outcomes and planning interventions for others to make to attain them. I perceived my work as engaging in the physical world, but ultimately dwelling in an abstract realm of concepts and values that I shared with my peers. But in my fieldwork, I saw planners concerned with making tangible things in their everyday work, such as drawings and diagrams, attending to a materiality that I had previously overlooked.

Making objects frames the shared goals of planners, if only as steps towards the larger and more distant accomplishments of master planning. I argue that each object they make establishes a sociomaterial distributed cognitive system, or in Ingold's (2000, 194) words, a taskscape: 'just as the landscape is an array of related features, so – by analogy – the taskscape is an array of related activities'. Though it may seem self-evident that planners make stuff all the time - particularly master planners who employ both planning and design skills¹² - they don't make the objects that they plan, and therefore planning scholarship has had little to say about them (Beauregard 2012). The very distance between the planners' artefacts and the objects of their plans, where materiality is perceived as inside the fabric of the built environment and outside practice spaces, renders the making of drawings and

¹² Contentious relationship between master planning and design – theorists continue to argue about it (Banerjee 2011; Gunder 2011; Krieger 2000; Steiner 2011; Talen and Ellis 2004). The significance of this distinction will be considered to some extent in the next chapter.

models seemingly mundane, in comparison with the larger cultural artefact of the city or region (Ryan 2011). Maybe the objects are overlooked because of their seemingly short-lived importance in long-term planning processes (Harvey 2009), as no sooner are these objects made than most are disposed of, changed or replaced. Or perhaps, as Miller (2010, 50) explains, the objects' roles seem negligible because they are so ubiquitous that we do not, or cannot, 'see' them. He argues that '[t]he less we are aware of them the more powerfully they can determine our expectations by setting the scene and ensuring normative behaviour, without being open to challenge [...] to the extent that we are unconscious of their capacity to do so'. My role, therefore, is to focus on the material engagement of planners making things, and from there, to explore implicit meanings (Beauregard 2015; Douglas 1975).

Archaeologist Colin Renfrew (2004, 2007) and cognitive archaeologist Lambros Malafouris (2004a, 2004b, 2013) explain the importance of the shift in how we conceive of material engagement:

One could say that things are to human intelligence as the eye is to sight, i.e. constitutive and yet invisible. Since the early years of our childhood we constantly think *through* things¹³, actively engaging our surrounding material environment, but we very rarely become explicitly aware of the action potential of this engagement in the shaping of our minds and brains. Put somehow differently, things are very good-to-think-*with* or *through*, but not so good-to-think-*about*. The more time you spent thinking *about* things the less of a

¹³ In the same book, Malafouris (Chapter 5) attributes much of his discussion to 'category mistakes' as developed by Ryle (1949) as he challenges the notion that the body and mind can be studied as two separate entities.

thing and the more of an object or category they become. Categories are more intelligible and familiar but they have very little to tell us about the qualities and powers of the things and materials that make up our everyday worlds of thought and action. (Renfrew and Malafouris 2010, 1)

Drawing from Hutchins's distributed cognition, Malafouris (2013, 2) proceeds to map out 'a cognitive landscape in which brains, bodies and things play equal roles in the drama of human cognitive becoming'. He outlines material engagement theory (MET) as an exploration of how things have formed a large part of shaping the human mind, based on three main hypotheses: the extended mind (Clark and Chalmers 1998), enactive signification¹⁴ (the idea that things acquire meaning as a result of what they are, and how and what we do with them), and material agency (Hutchins 2010b). Drawing from the writings of Gell (1998), Latour (1986b, 2000) and Vygotsky (1978 [ca.1930-1934]), Malafouris turns the emphasis away from the creative human acts of making materials, and from an artefact's symbolic or representative imaginings, towards interactive engagements between people and things. He considers agency, not as a human domain or a condition that one does or does not possess, but as continuously changing sociomaterial relationships and their enactment as a context of possibilities.¹⁵ This means that in any instant that we engage with the material, we perform its materiality, and generate its significance (Barad 2003, 2007).

¹⁴ Enactment signifies that meanings are made, and not passively received (Stewart, Gapenne, and Di Paolo 2010; Thompson 2007; Woolgar and Lezaun 2013).

¹⁵ Further discussion on agency in relation to planning theory will follow in Chapter 2.

As planners at work coordinate their activities towards the accomplishment of a specific material end – a model, a drawing, a report – their practices of making are forms of material engagement that do not merely create passive representations but generate systems. Making things, as Ingold (2013b) explains, is a material becoming as meshworks of relationships between people and materials emerge, or as Law and Mol (1995, 274) state, ‘materiality and sociality are produced together’.¹⁶ This idea challenges the assumption that distinguishes between the world of ideas and the physical world, or that one precedes the other, as the maker is one of multiple active materials participating and intervening. The maker is led by the materials, just as materials are shaped by the maker and the frictions or flows of practice between them are ongoing (Ingold 2007, 2010a, 2010b, 2013a, 2013b).

In a similar vein, feminist physicist Karen Barad (1998; 2007; 2014b) eschews the Cartesian separation of the world into matter and meaning, and facts and values, as significance and material are generated together. Humans and nonhumans are mutually entangled in phenomena, evolving relations of agency in which the boundaries and characteristics of things emerge. Barad (2007, 49) proposes a performative understanding of scientific practices that comes from ‘a direct material engagement with the world,’ and that seeing, hearing, making and talking

¹⁶ See also Callon (1986), Callon and Latour (1981), Knorr-Cetina (1999), Latour (1987) and Schatzki (2001). For an overview of the material turn in the social sciences, see Mukerji (2015), and Miller (2005) for a seminal anthropological discussion.

about things are all material practices (Shotter 2013). She does not distinguish people as completely separate agents but part of an indivisible entanglement of relationships of things in phenomena of mattering: 'Mattering is the ongoing differentiality of the world. Matter plays an agentive role in its ongoing materialization. Physical matters, matters of fact, matters of concern, matters of care, matters of justice, are not separable' (Barad 2014b; Shotter 2013; Savransky 2016; see also Latour 2004 on matters of concern and Bellacasa 2011 on matters of care).

Practices of making entangle the social, material, temporal and spatial in relationships¹⁷ of cultural practice as cognitive processes organize when people and things engage (Hutchins 2008). Setting the boundaries for the unit of analysis for this thesis is made possible by defining material artefacts first, as the specific goals of collaborative tasks in practice, and second, by their performative and agential roles through the dynamics of the tasks. Defining practices of making things as entanglements implies forgoing the study of cause and effect relationships and the notion of individual agency that is outside relationships; people and things shape, constrain and support practice (Bailey et al. 2012; Dourish 2004, 2007; Kaplan 2011; Orlikowski 2007; Orlikowski and Scott 2008a, 2008b; Yates and Orlikowski 2007). Having outlined the social and material contours of the thesis, the following section characterizes its analytic focus.

¹⁷ Barad (2007) calls this spacetimemattering

Zhang and Patel (2008, 137) define the concerns of distributed cognition with ‘how cognitive activity is distributed across internal human minds, external cognitive artefacts, and groups of people, and how it is distributed across space and time.’ It seems that there are two ways to read this statement; conceiving of time and space as contexts in which things happen¹⁸, or cognitive dimensions that are actively engaged in phenomena (Kirsh 1995; Spinelli et al. 2005; Snyder 2016). Following from Ingold (1993, 2010b) and Barad (1998), this thesis focuses on the second of these. Only a few studies of distributed cognition have focused on how the arrangements of time and space frame decision making and problem solving, structuring social organization and collaborative work, looking at patterns of mediation and simplification (Perry 2003). In planning literature, time and space are parameters traditionally attributed to defining and coordinating planning processes; how and why planners order time and space in their plans, how they imagine transformations through time and the future, reflect upon present actions and engage with the infinite histories of places and plans that surround them (Forester 1989; Harvey 1990; 2005; Massey 1992; Rittel 2010 [1987]; Schon 1983; Sitte 1889).

¹⁸ Conceptions of space, for example, have explored relationships between the built environment and culture in what have become classic ethnographic monographs (Durkheim and Mauss 1963 [1903]; Mauss and Beuchat 1979 [1906]; Arensberg 1988 [1937], and Wylie 1974 [1957] for example). Rodman (1993) shows how these writings often rely on Western ideas of representation and the assumption that there exists a divide between the built environment and culture, wherein dwelling and settlement plans are a passive background referred to purely through description. For others, the relationship between culture and the built form is an intrinsic part of social life, integrated into the beliefs, arrangements and change experienced by a social as it maintains itself within their natural and social environment (Rapoport 1969; Rykwert 1988).

Anthropologist Simone Abram explores time and space in planning through thick ethnographic study, unpacking its multiple temporalities. She and Weszkalnys (2011, 3) define planning as 'a way of conceptualizing space and time, and the possibilities that time offers space'. Their research shows how planning for the future contains more forms of temporal experience than merely anticipation, projection and order (Adams, Murphy and Clarke 2009). Abram's studies of community and land-use planning in England, Norway and Sweden, show that, despite the seemingly clear and linear view towards the future with which planning may be associated, planning practices are embedded with other multiple time scales, 'temporal conundrums' in the imaginaries of urban space (Abram 2014; Murdoch and Abram 2002; Weszkalnys 2010). Practices are persistently challenged to capture lived time and space, while planners sit through project cycles, committee and meeting routines, experience the political time frame of electoral rhythms, and mitigate sometimes competing futures embedded in participatory processes. She notes the proportionate scaling of spatial and temporal frameworks, where long-term strategic plans cover a larger geographic scale, mostly with the aim of coordinating municipal interventions. Plans whose internal strategic time frame is twenty to thirty years in the future are revised more or less every other electoral cycle.

She recounts, for instance, how two planning techniques conceive of time differently. Trend-based decision making and forecasting have been one approach -

picking up on current trends, extrapolating them forwards, and instating policies towards that condition. British planners have also used *backcasting* processes - starting with a vision for a future and then generating policies that may achieve it. The first imagines the future as an inevitable result of the present condition, where the second assumes a degree of flexibility, a future forged by decision making, and 'releasing the near future from merely extending trends set in the past' (Abram 2014). For Abram, the past is malleable and negotiable in planning mechanisms in so far as future scenarios are organized through past experience and the definition of recent trends (Murdoch and Abram 2002). The future manifests through a fragile equilibrium of time frames in the near and concrete, and the promised materialities of the elusive and abstract.

Drawing on Abram's work, and traditions in anthropology and sociology, I approach the perceptions of time and space in master planning as socially mediated and diverse concepts (Abram and Weszkalnys 2013; Adam 1990; Douglas 1978; Hughes and Trautmann 1995; Munn 1992).¹⁹ For social anthropologists, the concern with time and space is said to have originated with the work of Durkheim, and Mauss

¹⁹ Across the social sciences, the literature itself is incredibly varied, and though it is far beyond the scope of this thesis to offer a review, it is this very diversity that provides a foundation for analysis (see Adam 1990; 1998; Gell 1992; Hodges 2008; Low 1996; Munn 1992 for discussions). Any given configuration may bring together a continuous multiplicity of experiences, rendering time and space as qualitative dimensions, devices for the coordination and synchronization of social life (Thompson 1967; Zerubavel 1979), resources (Whipp et al. 2002; Guyer 2007), distinct cultural understandings (Adam 1990; Nowotny 1992), duration (Bergson 1913; 1965; Deleuze 1988; 1994; Whitehead 1978), and compression (Castells 1996; Virilio 1991), to name a few (Gurvitch 1964 and Gell 1992 provide some typological classifications to distinguish across the literature, and Bourdieu 1977; 1990 raises methodological concerns).

and Hubert (1909). Durkheim posited that since Aristotle, there are ‘what philosophers call the categories of understanding, the ideas of time, space, class, number, personality [...] correspond[ing] to the most universal properties of things.’ He argues that time and space are pervasive across all thought, ‘for it seems that we cannot think of objects that are not in time and space, which have no number, etc.’ (Durkheim 2012 [1915], 9). Time and space can therefore be differentiated ‘on condition of distinguishing its different moments [...] it is the same thing with space (Durkheim 2012 [1915], 10-11). Furthermore, time and space are socially mediated, both expressing and generating society through techniques of time reckoning and values, rituals and organization (Goody 1991).

For Douglas, time and space are variable conditions of a cosmology (Douglas 1978, see also 1973; 1982 on cosmologies) and, as with Durkheim, any notion of space and time is circular – derived from and shaping society (Gell 1992). Any study of social conceptions of time and space is characterised by a form of self-referentiality, necessarily referring to the cosmology’s own beliefs, practices, and patterns.

Rayner (1982, 254) argues that time and space are therefore ‘primary ordering concepts’, that exert their own constraints on other aspects of the cosmology and reinforce it. Drawing from Kant’s (1999 [1781]) theory of time and space as categories of perception, Rayner’s research shows how different perceptions relate to the social organization of groups, and more specifically, how perceptions are modelled on the group’s internal organization and view of their position in the world. Rayner’s approach to the social mediation of time and space echoes the

work of Evans-Pritchard (1940), Levi-Strauss (1966), Gurvitch (1964), and Leach (1961), in that they conceive of different forms of time at work simultaneously. However, Rayner's approach emphasises that time and space are entangled in a single social cognitive system.²⁰

Rayner's view embeds social mediation within groups and renders it very relevant for the study of practice within organizations. He distinguishes between historical and operational time and geographical and operational space. The operational dimensions enable the capture of everyday practices, routines, and existing social arrangements. They are concerned with how space and time are ordered and experienced in daily life. Often operational time and space are conceived of as a resource, either highly divided or continuous and shared; they are embedded in core perceptions of social organization. Historical time and geographical space relate to conceptions beyond personal experience, including the ordering of events and places in a manner that is significant to a society. These perceptions are likely to have been remembered, learned or imagined, and are thus given to cognitive acts of compression or extension in relation to the social group. In drawing from Douglas's work, Rayner asks what kind of social organization is capable of

²⁰ Similar to Evans-Pritchard's approach, chronicling Nuer experiences of time and space as oecological (relating to the experience of material environments) and structural (concerned with social arrangements and practices), but importantly stating that 'in a sense all time is structural, since it is a conceptualization of collateral, co-ordinated, or cooperative activities' (Evans-Pritchard 1940, 104). Others distinguish more clearly those perceptions of time that are constituted socially, and those beyond the social structure, or rather, the distinction between the real and the experienced (see Gell 1992; Bloch 1977)

supporting certain patterns of thought, and in turn, what kind of perceptions are capable of supporting certain forms of social organization.

In a sense, Rayner's heuristic categories may be seen as precursors to practice theory, as they capture and interpret different dimensions that relate people's activities to the world in which they live (Bourdieu 1977; Ortner 1984). In her review of the anthropology of time, Munn suggests that temporal experiences are directly related to temporalizing practices in social life, wherein 'spatial and temporal dimensions cannot be disentangled, and the two commingle in various ways (1992, 94) or, as she stated earlier, '[S]ociocultural action systems [...] do not simply go on in or through time and space, but they form (structure) and constitute (create) the spacetime manifold in which they "go on"' (Munn 1983, 280, see also 1986; 2013). Her position is that through practice, societies generate values, in turn creating and perceiving 'intersubjective spacetimes' constituting different forms of relationships, such as communities, selves, hierarchies, etc.

Following on from these ideas, an analysis framed through the study of how planners perceive time and space has three related attributes that require a short discussion. The first, as stated earlier, is nonlinearity, wherein time is perceived not merely as sequential moments but a continuous multiplicity of spatial and temporal juxtapositions (Gell 1998). Space and time are attended to through various devices that locate and engage the past, present and future in a variety of contingent

relations (Munn 1992; Zerubavel 1985). Munn (1983; 1986; 1990) and Rotenberg (1984) describe conditions of imagined pasts and futures contextualized in the present, and thus each temporal frame engages with the other as their meaning is co-constituted in practice. For the purpose of this thesis, the study of perceptions of time and space removes concerns with cause and effect relationships, disaggregating readings of agency, intention and decision making, often assumed to be synonymous with planning, that may overshadow situated practice (Rydin 2014; Hart 1976; Goldschmidt 2014; Groth 2016, discussed further in Chapter 2).

The second attribute of this study is a reduced sense of content (Gell 1992) or substance (Faludi 1973). Ryan (2011) notes that often in planning literature, discussion planning practices turn quickly to the finished plan and urban conditions while, through language, the object of planning emerges as the built environment; in other words, discussions about means are often bypassed by those about possible ends. By focusing on the ways in which time and space become salient, the substantive qualities of planning projects and cities are reframed as they are observed inside social arrangements and situated practice. Attending to *how* planners think rather than *what* they think about, the discussion shifts away from concerns with urban matters and particular design decisions, towards the study of cultures of practice.

In her study of architects at work, Cuff (1992, 111) insists on the importance of studying time as necessary because without it, 'design practice has defied explanation, since each level of analysis confronts a moving target, from the individual architect to the office make-up to the building industry as a whole.' The study of perceptions of time and space emphasise the everyday sociomaterial arrangements of making and mattering as they emerge. This approach supports the anonymity necessary in writing up the thesis, as agreed with both companies participating in the study; time and space as categories of thought help to reframe details about projects, people and organization, to reach a coherent form of anonymization (Simakova 2013; further discussed in Chapter 3).

The third major attribute of the study's focus is the pervasive and analogous characteristic of time and space. They help the researcher capture certain cross-cutting themes and patterns inherent in practice; as Gell (1992, 315) describes the study of time 'provides the means for the relative unification of otherwise diverse categories of processes [...] biological processes with social ones, psychological or subjective processes with objective, clock-timed ones, and so forth'. Taken a step further, these concepts transcend the Cartesian distinctions between ideas and the physical world (Ingold 2000, 2006), matter and meaning (Barad 2003, 2007) and therefore, between craft and intellectual work (Marchand 2009), and shift the focus towards patterns of phenomena and relationships. Studying perceptions along these two dimensions helps to circumvent assumptions and certain black boxes (Callon and Latour 1981) inherent in planning discourse and practice, such as

pervasive allusions to iterative planning methods (Hart 1976), forms of power and authority (Flyvbjerg 1998; Metzger et al. 2017), disjunctures between planning and realities on the ground (Peattie 1968, 1990, 1991), neoliberal or other value systems (Gunder 2010; Huxley and Yiftachel 2000; Sandercock 1998), and failure (Scott 1998; Talen 1997). While this thesis does not underestimate the need to explore these dimensions of planning, they have generated narratives that are deeply ingrained in planning's extensive scholarship and, perhaps also, characterize the proverbial gap between discourse and praxis (Alexander 1997; Allmendinger 2009). The analytical frame of perceptions of time and space may consider and possibly re-examine ideas about planning within case studies of everyday practice (Flyvbjerg 2006).

Thesis Overview

To answer the question concerning how master planners think within the framework of sociomaterial distributed cognition and perceptions of time and space, I consider more specifically: How do master planners collectively achieve complex tasks? How do relationships between the material and social in everyday practice frame perceptions of time and space, and how do these in turn reinforce or challenge sociomaterial arrangements? What conceptions of master plans and planning practices are made salient?

To respond to these questions, this thesis offers a study of master-planning teams as they make plans ‘in the wild’ of their workplaces. It is arranged according to tasks of making as the units of analysis, in particular three different objects whose making was observed during fieldwork: Model, Drawing and Report. The chapter on each object traces how it was made by reading forward the planners’ practices, which Ingold describes as a tracing of creative practices and improvisation as they unfold (Ingold 2010b, 2013a). Reading forward helps to shift attention towards situated practices and away from the professional accounts of linear methods or iterative logic in design, from implied rational processes and causal connections between intentions, practices and outcomes (Cuff 1992; Forester 1996). I order the analytic chapters according to the times I observed artefacts being made in relation to project frameworks; the planners made a model at the beginning of the project, they continuously made drawings throughout projects, and reports were used to complete projects.

Before the analytic chapters, I offer a brief overview of how this thesis is contextualized in planning scholarship in Chapter 2. While it is beyond the scope of this thesis to provide an in-depth examination of the topic, and though the chapter follows a mainstream view of the history of planning thought from an essentially Anglo-Saxon point of view, given that the fieldwork is situated in London, I find it necessary to address the planning ideas that have helped to shape both this thesis and its field. I share views with contemporary planning scholars whose work has, on the one hand, helped to shape my ideas, while on the other, assisted in me in

carving out my contribution to the literature. I consider three forms of conceptions of planning thought – morphological, cultural and relational – the first two mostly from within planning literature, and the last section from planning, anthropology and science and technology studies (STS) engaged in the study of planning practices. I explain how and why master planning has been removed from planning literature, as planning thought is increasingly perceived as social, relational and contingent, and thus less suited to morphologic reductions and assumptions. I explore planning thought as it is embedded in conceptions of the planning discipline and research. The chapter concludes with an analysis of how a distributed cognition framework juxtaposes ideas across the planning literature and addresses some of its gaps.

Chapter 3 reviews the research methods and methodology based on a distributed cognition approach and participant observation (Harris 2004; Hollan et al. 2000; Rogers and Ellis 1994). I draw from Karen Barad's (2007) theory of intra-action in which she advocates a reading of patterns of difference. This helps me analyse the subtleties of actions and meanings in emerging relationships that I observe in the field within distributed systems of coordinated tasks. In this chapter, I describe my research methods and what transpired in the field, including access negotiations and the signing of confidentiality agreements, participant observation and ethnographic interviews, considering challenges faced in the field, both in terms of my identity as a researcher and my relationships with informants. I reflect on the shifts between native and stranger identities experienced in the field (Agar 1980; Amit 2003; Marcus and Fischer 1986; Narayan 1993; Wulff 1998, 2000), and my

active attempts to 'make the familiar strange' (Van Maanen 1995, 20) through Nicolini's (2009) concepts of zooming in and zooming out in order to generate distance. Adopting a parallel-field-sites approach (Bourdieu 2003; Ewart 2011) helps to reflect on my assumptions as an architect master planner by further creating conceptual distance. The chapter concludes with a discussion of how the process of ethnographic writing has embedded the logic of the Confidential Disclosure Agreements, shifting the unit of analysis towards specific practices of making artefacts so as to reconcile the abstractions of anonymity with the everyday realities observed and experienced in practice.

Starting off the analytic section of the thesis, Chapter 4 follows the making of a physical model in the early days of a master planning exercise, tracing the relationships between the model's material attributes, social arrangements and planning ideas. It attempts to identify the different sense making practices embodied in the model as it emerges, considering its role as a boundary object in the making (Star and Greisemer 1989; Star 2010). In contrast with Harvey (2009) who attributes physical models with relative inflexibility, unidirectionality and short-lived relevance over the course of a project, this chapter questions whether the materiality of physical models should necessarily be regarded as a limitation. The story reveals the model to be a mode of framing the design and decision space of practice, making continuous geographies amenable to design work by separating a piece of land from its environment to form a site. The model then becomes the terrain for simulation (Rayner 2000, 2012). It forms a collaborative base by enacting

strategies through which to engage with the client, to generate discussion and establish an open working relationship.

Through the model, the planners address three main ambiguities: the project brief is vague, and the design team is unsure what to plan, the client's internal capacity to define their objectives is unresolved, and the relationship with the client is uncertain with no contract between them as yet. The making of the model thus becomes a physical manifestation of ambiguity, which the planners manage by organizing social and material practices. The model's materials guide the planners as they identify, separate, design and then reassemble the project's layered forms. The design team quickly and diligently organizes itself around the multiple tasks of model making, establishing sequences of practices to feed one another information, integrated into practices of research, sketching, digital drawing and modelling. They order their work in attending to the material production of the modelling workshop, and time and budget constraints, and how the client may respond to their ideas.

As the pieces of the model come together, the cartographic sense of scale that is tangibly constructed is not only a simple representation of a plan, but a composition of scaling practices, reconciling temporal and spatial scales as a mode of generating collaborative practice, and enacting a relationship between planners and their client wherein an absence of certainty was materially evoked and challenged. This chapter explores how the making of the physical model is a mode by which the

planners enact the communicative and collaborative relationship they wish to secure with the client. By designing and scaling their work towards the model, both the planning team's time and their client's attention were configured towards the project's disambiguation. The model's designed flexibility and ambition enacted the desired longevity and the planner's willing adaptability, inspiring the clients to become more confident in their decisions and ambitious with their ideas for the site. For their part, the planners knew that this model was a schema for the beginning of a relationship and that despite its finished appearance, the planning exercise was only in its beginning stages.

Chapter 5 follows how practices of making drawings enact sociomaterial contingency on the ground. I define drawings as various plans and cross-sections, that reference one another within projects to provide a picture of a coherent spatial and material whole. As I follow the making of a master plan in a late stage of development, the drawing emerges as a contingent apparatus by which planners follow and coordinate temporary social, spatial, political and economic relations, at the same time embodying the uncertain social arrangement of planning as a discipline. In contrast with the pervasive allusion to drawings as finished artefacts, the study reveals their continued incompleteness in practice. The ethnography tells the story of how planners prepare to freeze the masterplan, a term used when planners submit plans to the client, knowing it captures a temporary pause, as the basis for discussion and further elaboration. At the same time, planners continue to annotate their drawings to capture ongoing changes in preparation for the next

stage when they will unfreeze the plan. Contrary to certain anthropological texts that have critiqued masterplans as complete and reductive visions of the future (including Scott 1998; Ferguson 2006; Holston 1989, Holston and Appadurai 1996), the stories reveal that contemporary master planning is a perpetually incomplete process, negotiating the future with an ongoing complex present.

Seeing drawings like a planner is an important element in professional enskilment (Ingold 1993, 2000; Grasseni 2007), wherein the skilled vision of the planner entails reading a plan like a narrative unfolding. I follow how planners navigate the ambiguities that stem from the lack of institutionalization of master planning: negotiating vague drawing conventions, misunderstandings about the drawings' role in the planning process, and the planners' uncertain career paths.

Furthermore, I consider the relationship of planners to masterplan drawings, tracing the social arrangement of the professional master planner. Master planning emerges as a complex and uncertain social activity, configured in everyday practices and an absent institutional framework for junior planners. The drawing's statutory role contrasts with the unregulated planning process, as reading and making drawings are acts of regulating space and embodying deregulated temporal frames. Sociomaterial relations are tested and negotiated as they are assembled in the drawing, as its lines chase the present and negotiate the future. This chapter argues that within the drawing is the configuration of the master planning discipline - that drawings embody a profession continuously defined and challenged through

practice and a community of practitioners whose boundaries must remain unclear to capture complex relationships on the ground.

In contrast to the previous chapters, where boundary objects were made as the basis for communication and collaboration (Star and Griesemer 1989), Chapter 6 follows the making and use of reports in a planning consultancy firm, as they create social buffers and mediate knowledge exchange. Though the structure of the company seems hierarchical, I argue that report making reveals a more prominent divide in social organization, generating two distinct groups with discrete cognitive schemas of core and periphery. Though the consultancy is known for its innovative methods, report making practices seem to limit the exchange of information and knowledge. Alluding to the work of Riles (2000; 2006), and Sellen and Harper (2002), I consider the links between patterns embedded in the structure of the reports and their respective patterns of practice. The report as a ubiquitous - though often undetected - force in everyday practice constitutes a range of digital practices distributed through the studio. I follow the digital workflow of report making, tracing the apparent seamless movement of people, tasks and information across the studio space, to consider what patterns of everyday order and distribution are embedded in the document. The report's digital template emerges as an ordering mechanism, a tool for managing individual projects and framing the overall expectations and development of consultants in the company.

I further study the role of reports in shaping a historical company narrative and stabilizing the company's social organization. The report template emerges as a 'sacred relic' of sorts, embodying a period of historic importance to the identity of the company; a mechanism of optimisation by which to raise efficiency and replicate a consistent standard, the template is a device by which to reduce risk, create cohesion and enable a core group of principals to ensure the company's continued existence without peripheral staff. Furthermore, it safeguards the methods of the core group protecting their ability to control the work. The absence of a curated archive of reports enacts a material decision on the part of the principals in shaping the company's collective memory. Lacking reference materials of the company's methodological history, the identity and history of the company is informed as much by forgetting as it is by remembering. A few copies of paper reports are left only in the reception space, the liminal space between the outside and inside of the studio, in which all rituals are performed - events that shape the collective memory of the company. Rituals adhere peripheral staff to the overall social organization characterized by a core-periphery structure. Embedded in the report structure is the core group's distinct pattern of sense-making; a controlled and unnegotiable past and a repetitive present, both of which enact and inform routines through which to imagine the company's future.

In Chapter 7, I synthesise the conclusions of the empirical chapters to respond to the research questions. The findings show that each of the tasks – making the model, drawing and report – are constituted by the distributed cognitive processes,

in which perceptions of operational time and space, and temporal and spatial uncertainty are entangled. As the master planners make the artefacts, the objects become performative devices that assemble and enfold uncertainties into the present task. The agential properties of future uncertainties emerge as salient dimensions within planning practice. The planners' modes of addressing uncertainty enact cultural processes, collectively achieving shared understandings, contextualizing expectations and coordinating sociomaterial arrangements. On the basis of these findings and the method of inquiry, I outline three shifts that this thesis contributes to the literature on planning practice: first, it proposes a method of addressing the internal coordination of teams of planners and their cognitive complexities; second, it focuses on an observable unit of study, which enables the analysis of the uncertain, ambiguous and absent dimensions entangled in planning thought; and lastly, it renders the concept of a planning culture amenable to reflexive conceptions of everyday practice, and able to capture the multiple ways in which planners conceive of and enact the ecology of planning institutions in which they are embedded.

CHAPTER 2: CONCEPTIONS OF PLANNING THOUGHT

This chapter reviews the literature on how planners think, particularly how planning scholars and practitioners think they think. The aim of the chapter is twofold: first, to engage with the theoretical context for the thesis within planning discourse, and second, to locate the distributed cognition approach within the literature. While distributed cognition has not been used to study master planning in the past, there exists an extensive theoretical foundation from which to draw and with which to engage.

The chapter is divided into four sections. In the first, I offer a historical overview of the development of planning thought, tracing it through planning and design theories. I call this section morphological because it covers theories that conceive of thought processes as easily represented in schematic form. The second and third sections examine contemporary theories that depart from abstract schematic form and position planning within practice. As such, thought becomes embedded in conceptions of the discipline and planning research. The cultural approach suggests that thought is influenced by collective cultural environments, beyond what is visible in everyday practice. The relational approach considers ways of capturing multiplicity and uncertain trajectories in planning practices to which planning thought conforms, looking particularly at Actor Network Theory and anthropological studies of planning that study sociomaterial relations. In the final section, I consider how a distributed cognition approach juxtaposes conceptions from the literature

and provides a way to explore existing gaps in the literature. I draw from Karen Barad's (2007) theory of intra-action for discussion.

To focus the chapter, I have had to exclude an extensive literature. First, this chapter draws mostly from literature that is Anglo-Saxon, and that is relevant to a study based in Britain. Though planning thought is by no means universal, Ward (2012) argues that planning discourse is composed like an international patchwork, with ideas travelling globally through journals and conferences (discussed further in this Chapter). It is beyond the scope of the thesis to explore every planning idea on the topic of thought. Furthermore, the concern here is to provide a review of *how* planners think rather than *what* planners think about. In a sense, planning theory is already partitioned. Faludi (1973) states that within planning literature there exists theory in planning and theory of planning: the first, substantive theory, considers the objects of planning and the content that planners engage with, whereas procedural theory looks at the planning process and how it is performed.²¹ While some theorists argue that the two are not separate (e.g. Næss & Saglie 2000), this chapter is largely assisted by literature that takes a view that process can be studied apart from substance.

²¹ Hightower (1969) and Friedmann and Hudson (1974) discussed this divide in relation to how planning theory is taught at university.

This chapter contextualizes master planning within planning theory: a contentious move among planning scholars. For some planning scholars, master planning is urban design and not planning (Carmona 2014), wherein urban design is a focus on the public spaces between buildings and the design of specific places, while planning is a regulatory framework. Other researchers and theorists emphasize the overlap between the two, such as the idea that urban design is one of several branches of planning (Alexander 2015; Gunder 2011; Steiner 2011). Historically, Rittel (2010 [1987], 187) uses the terms planning and design interchangeably,²² stating:

Designing is plan-making. Planners, engineers, architects, corporate managers, legislators, educators are (sometimes) designers. They are guided by the ambition to imagine a desirable state of the world, playing through alternative ways in which it might be accomplished, carefully tracing the consequences of contemplated actions.

Within the historical overview, I show this debate to be a part of the changes that occurred in planning thought over the last hundred years, and why for the purpose of this thesis, it is useful to regard master planning as engaged in design. This view originated from my previous professional experience as a master planner, though it is an approach I interrogate and explore in the analytic chapters.

²² Protzen and Harris (2010, 2) in their book, 'The Universe of Design: Horst Rittel's Theories of Design and Planning' consider his use of the terms planning and design, stating: 'Rittel's use of the terms as synonymous is consistent with his general definition of design, and reveals his focus: he was looking at the nature of the problem and questions of how to solve the problems better'.

Before venturing to discuss planning generally and master planning in particular, it is important to note that there is no widely accepted definition of planning. As a theoretical subject of study, planning's boundaries are particularly elusive due to four main ambiguities (as outlined in Campbell and Fainstein 1996). First, planning questions closely relate to other very broad fields that concern social and spatial transformation, the role of the state, policy, law and citizenship. At the same time, as a role of planning is to intervene in urban development, any writing on cities, communities, social networks, public health, infrastructure, etc., overlaps with planning's field of interest. As a result, planning theory draws from and contributes to all the social sciences, and it is difficult - or perhaps ill-advised - to try to define any single, specific scope. Planning theory's evolution is also increasingly influenced by philosophical schools of thought.²³ Synthesising this chapter, for example, required delving into a range of disciplinary literature.

Second, professional purviews and boundaries between practices of planners and other professionals are not mutually exclusive: real-estate developers, architects, city council members, engineers, etc., also practice planning, while planners sometimes take on other roles too (Abram and Weszkalnys 2011). Definitions of planning can generally be divided into those that focus on its objects, such as the built environment, the urban or other land use patterns, and those that emphasize

²³ For instance, collaborative planning based on Habermasian theories of communicative action (Healey 1997; Innes 1995), Foucauldian discursive approaches (Hajer 1995), Lefebvrian heterogeneous conceptions of time and space (Amin and Thrift 2002; Massey 1999; Thrift 1996), Lacanian and Deleuzian multiplanar approaches (Gunder and Hillier 2004), and network urbanism (Dupuy 1991).

planning's methods, or decision-making processes. However, clear this distinction may seem, it quickly comes undone as theorists debate what the object of planning is (for instance, how does one define a city), and what methods have the capability to respond to such an object. Furthermore, there is only limited discussion on planning theory typologies - heuristic devices that 'help to map the landscape of ideas that influence a particular field' (Allmendinger 2002, 77), which would help to conceptualize, classify and compare different schools of thought. Finally, planning cannot be defined by a set of methods or processes, as it borrows both methods and methodologies from various other practices, including policy making, community development, architecture, geography, sociology, landscape design, to name a few. Theories of planning are, therefore, far from constituting a coherent body of scholarship. The range of theories used to describe planning constitutes a multitude of different historical narratives of the discipline, or as Freestone (2000) argues, planning is actually composed of multiple assemblages of 'plannings'.

Any historical narrative is therefore always doomed to be incomplete and controversial, which is certainly the case in the following section. It focuses on two overlapping developments in how planning thought is conceived. First, there is a clear shift from focusing on the planning processes of individuals, towards an increasingly social practice. Second, it looks at the separation of the planning discipline from the design of physical environments (Forester 1985; Rydin 2014), which has shaped some of the ways that planners think about how they think.

Morphological

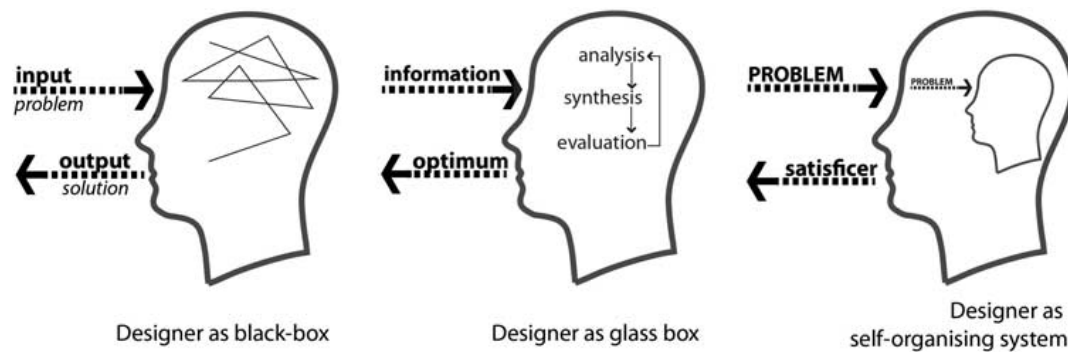


Figure 2.1: The main conceptual models of design discussed in this section
Source: Caliskan (2012, 4) after Jones (1992)

The history of planning practice is often presented as the stories of great men, pioneers of the profession, each associated with a different ideological approach to urban form (Hall 1992; Sies and Silver 1996). The concern of these pioneers of planning was with city development that they viewed as disordered, even chaotic, resulting in uncontrolled urbanization, inequalities and inefficiencies, and they believed that some form of spatial order and top-down control could solve these problems. Order and control were expressed in fixed master plans: blueprints for new settlement designs. Authorities and decision makers were also looking for solutions to solve the problems of nineteenth century industrial urban challenges including growth, densification, the spread of disease and socio-political unrest. Scottish urban theorist Patrick Geddes often called the father of modern planning, argued that urban settlement patterns were part of an evolving organic system

whose study could bring about rational solutions to urban problems²⁴. Inspired by scientific method, Geddes saw planning as a set of finite practices, relating both to the perception of the settlement forms as discrete units and to problem-solving as a direct link between diagnosis and treatment, developing a sequential method for practice in the form of survey-analysis-plan (Geddes 1915).

Early forms of administrative planning regulations, particularly at the national scale, formalized the use of the master plan as tool to manage physical and social change in cities. This period of professionalization organized practitioners as a community of practice (see Wenger and Lave 1991) and formalized their education (Bassett 1938; Firley and Groen 2014). The master plan became a manifestation of a concept, and according to Abbott, it performed 'as an articulation of the belief that the city can be formed into a single, identifiable entity with a particular structure and character' (Abbott 1985 in Palazzo and Steiner 2012, 190), suggesting that the problems that the plan was expected to address are universal in that they are shared by all urban citizens. Planning, in this era, searched for optimal urban structures. Blueprint plans were perceived as definitive means towards certain ends that will bring about intended change towards universal progress (Faludi 1973). The planner's role was to pursue these ends as an expert in identifying problems and

²⁴ The Geddesian approach is often cited in contrast to earlier conventions of spatial design as inherently artistic or intuitive (see Sitte 1889 for example).

practising linear problem-solving methods, inspired by Geddes and scientists working at the time (Hall 1992; Lane 2005).

During the early post-war years, blueprint-planning ideas became increasingly standardized and codified, and their technical views of planning were the foundations of different national planning mechanisms that evolved in western governments (Hall 1992). Complex post-war reconstruction efforts in Europe and sprawl in the United States crystallized national planning institutional frameworks and administration. Practitioners were required to address an unprecedented scale of problems. The rational-comprehensive model through which planning thought was conceived, defined planning thought through a normative framework by which decisions are made. Drawing from Descartes's (1996 [1637]) *Discourse on Method*, the rational-comprehensive worldview assumes that decision makers can possess all the necessary information, skills and resources.

To respond to the new scale of urban problems, planners began experimenting with a systems approach, also known as the synoptic planning approach, drawing from systems theory that had been applied to military problems during the Second World War. The systems approach was conceived in opposition to the blueprint master plan, shifting its focus from the physical form of built environments to the comprehensive control and optimization of their existing socio-spatial systems (Hudson 1979). The methods relied heavily on quantitative analysis and

mathematical models to inform a rational linear process of decision making. The idea was find ways to capture the operational mechanisms that control the behaviour of complex spatial systems, relating economic, social and physical dynamics.

Simon (1956; March and Simon 1958) suggested that rationality cannot be so comprehensive because planners must engage with incomplete information and possess limited resources that they can deploy. The ambiguous contexts in which they work lead to an inability to separate values and facts. They argue that the limitations and ambiguities that planners face remain hidden in the linearity of the rational comprehensive model, and propose a model of bounded rationality, that recognizes its own limitations. In planning theory, the idea of bounded rationality captures inherently limited capacities that planners have, leading them to always make do - a satisficing position rather than a maximizing one (Forester 1984).

Lindblom (1959; 1979) also critiqued the idea of comprehensive rational paradigms and argued for an incrementalist approach to decision-making processes that consist of a series of small steps towards larger scale goals. He argued that Simon's bounded rationality would result in incrementalism. Describing it as the 'science of muddling through' (1959, 87), Lindblom emphasized the plurality of planning interests and made more room for uncertainty in the planning process through increased consultation. Plans were to be the product of ongoing adjustments of

policy interests, de-centring the role of the planner. Incrementalism was criticized for not making room for alternatives that differ radically from the status quo (Alexander 1986; Faludi 1973). To address this limitation, Etzioni (1968) developed the mixed-scanning approach, suggesting that decision-making happens both at the small scale, tactical realm, and at the strategic level for a broader view. The process would require organizations to scan different decision-making levels and then allow planners to choose from the range of operational and strategic, or functional and normative implementations. Control of the process was with the planner and the public remained outside of the process.

Friedmann (1967) returned to the idea of bounded rationality but considered it overly reductionist in reference to planning. Instead, he developed a model that compounds three interrelated and simultaneous rationalities. In Friedmann's model, *bounded rationality* refers to the macro-structural institutional context including the political and administrative structures and economic and technological local development (Friedmann 1967, 235). It helps to determine formal planning processes. *Nonbounded rationality* constitutes the ideologies and norms that form planning goals. These objectives may cover over-arching principles such as democracy, sustainability, resilience, inclusiveness, diversity, etc., (Friedmann 1967, 237). Experiential knowledge based on traditions and values, Friedmann attributes to *extrarational thoughts* (Freidmann 1967, 238), which are not codified or formalized but form a wisdom that contributes to practices.

In parallel to these explorations in planning and policy making discourse, additional conceptions of thought emerged from the Design Methods Movement whose origins also lay in the application of scientific methods to challenges emerging after the Second World War. These decision-making techniques incorporated an emphasis on capturing creativity in thought models (Hall 1962; Archer 1965; Alexander 1964; Jones 1970; Broadbent 1988 [1973]; Cross 1993). In 1962, Horst Rittel, Christopher Alexander, Bruce Archer and John Chris Jones, founded the Design Methods Movement, advocating an operational view of design projects that introduced a range of methods emphasizing a rigorous, rational or scientific approach to design thinking, that found its way into planning conceptions.

Also in 1962, Morris Asimow published his seminal book, 'Introduction to Design', in which he describes the morphology of design process and thought as 'the study of the chronological structure of design projects' (see Figure 2.2). He writes:

Each design-project has an individual history which is peculiarly its own. Nonetheless, as a project is initiated and developed, a sequence of events unfolds in a chronological order forming a pattern which, by and large, is common to all projects [...] Design is a progression from the abstract to the concrete. (This gives a vertical structure to a design project.) ... Design is [also] an iterative problem-solving process. (This gives a horizontal structure to each design step.).²⁵ (Asimow 1962, 5)

²⁵ Markus (1969) and Maver (1970) expanded on the iterative decision-making feedback loop for architectural design and were influential across design fields.

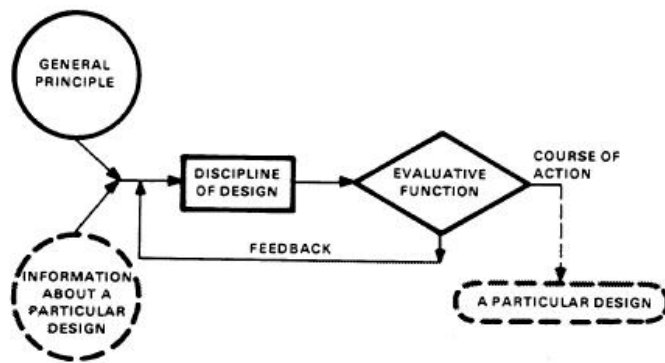


Figure 2.2: The design structure
Source: Asimow (1962, 5)

Later on, the idea of planning as an iterative process grew in strength and to this day remains one of the more commonly used terms to describe planning thought. Hart (1976) wrote an article entitled ‘Planning as an Iterative Process’ in which he explored how planning laws in Britain adopted new forms of thinking to incorporate uncertainty about the future into an adaptive process. He noted that planning had been a top-down mechanism to control change, as change was perceived as progress, and the future had been perceived as predictable, based on the past as a source of knowledge. However, following the evolution between the Town and Country Planning Acts of 1947, 1962 and 1968²⁶ he notes that the objective of planning became to enhance flexibility in planning thought. The concept of a planning process was converted into a ‘successive recasting of intent’ (ibid., 34), a

²⁶ In Britain, systems planning brought about the first formal instance on public participation as part of the method to respond to planning goals. For the first time, the planner faced the public. However, this level of participation continued to view social identity as homogeneous, representing a single public interest (see Lane 2005 for discussion).

‘spiral composed of two [...] principal strands: commitment-anticipation and information-adaptation’ (Hart 1973, 36; see Figure 2.2). This challenged the previous conception of planning thought as a linear decision-making process based on a direct relationship between means and ends. The iterative model supports an ongoing testing and modification of problem and solution definitions. Iterative planning left more room for uncertainty as to what the final outcome might be.

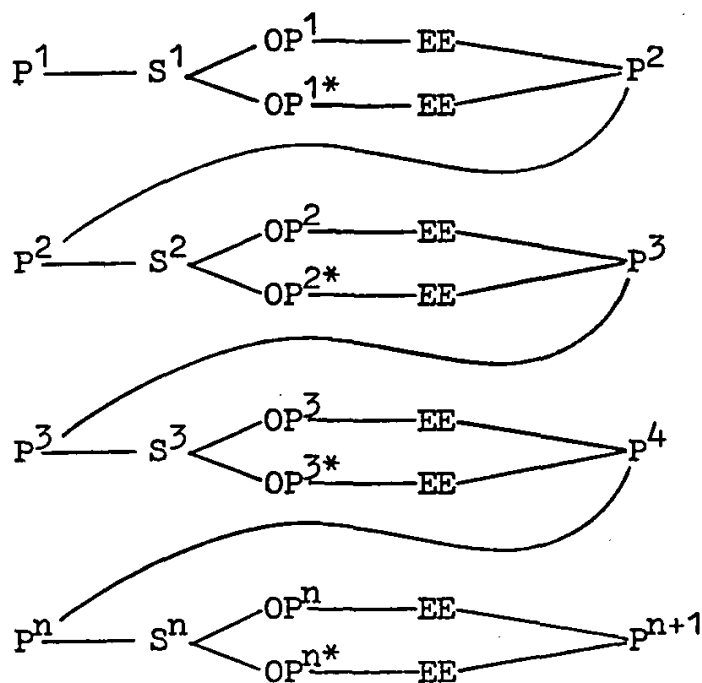


Figure 2.3: Planning as an iterative process. P is the perceived problem, S the perceived solution, OP is the operating programme being tested and EE are the effective elements that are identified and compounded through the process. Source: Hart (1976, 36)

Planning theorists and practitioners saw design as a process triggered by a problem or set of goals, and through information gathering and processing, finding alternative options and ending with a feedback loop. Though they readily adopted

the iterative conception of their practices as cyclical thought processes, they struggled to mitigate the scale at which they were designing in this model. While designers could make prototypes and test their designs to inform the feedback loop, the scale of planned intervention at the city level did not allow for trial and error or any immediate feedback as to the success of their plans. Therefore, conceptions of planning thought necessarily included analytic and conceptual models of prediction, to describe future change by making sense of past events on the ground and avoid the repetition of past mistakes (Çalışkan 2012; Chadwick 1971; Hall 1983; Levin 1966; Scott 1998; Wilson 1968).

In the context of the civil uprising and student movements of the 1960s, an advocacy and then activist phase of planning evolved to represent diverse social voices in the planning process (Krumholz and Forester 1990). Though problem solving was still very much the mode of thought, and the planner remained in the traditional role of social guidance, these planners rejected scientific and rational linear design methods. Advocacy and activist planners strove to remove their practices from the top-down homogenization of physical planning and questioned master planning practices, as they spoke for different communities in state bureaus and community organizations. The 1970s saw the development of a critical planning theory for which there was a fundamental break from the previously modernist notion of systematic thinking about problem-solving planning methods and managed top-down urbanism (Friedmann 1973a, 1973b; Swyngedouw 1997; Wildavsky 1973). The Design Methods Movement found its assumptions under

attack for its inability to account for the dynamic and emergent complexities of urban space and society (Jacobs 1961).²⁷

Rittel and Webber's seminal treatise, 'Dilemmas in a General Theory of Planning' (1973) unpacks the intractable nature of societal problems associated with urban planning and policy design, whose openness makes them elusive and 'wicked', a term Rittel developed to contrast to the tame problems of maths, chess or puzzle solving (see also Skaburskis 2008). Wicked problems resist resolution because they cannot be simply defined, presenting complex interdependencies based on frames of understanding. Rittel's view was that there is no such thing as objective planning, but rather value systems and judgments through which the planner reasons (Rittel 1972, 2010 [1987]). Rittel and Webber voiced concern about the diverse and sometimes contentious values with which planners have to grapple in their decision making: 'As the sheer volume of information and knowledge increases, as technological developments further expand the range of options, and as awareness of the liberty to deviate and differentiate spreads, more variations are possible' (Rittel and Webber 1973, 159). Since the publication of their paper, and Rittel's continued work on design methods, planning thinking and approaches responded to the increasing complexity and diversity of socio-spatial systems by re-examining and critically engaging with planning objects and processes to try to bring

²⁷ Rittel later also criticized the premises of the Design Methods Movement in this way (Rittel 1972).

them closer together. The notion of wicked problems led Rittel to a radically new conception of design and planning thought. He described the design process as inherently argumentative, in which the designer continually raises questions and argues with himself and others over the advantages and disadvantages of alternative responses.

Rittel uses the terms 'design' and 'planning' interchangeably, where design is 'an activity that aims at the production of a plan, which plan – if implemented – is intended to bring about a situation with specific desired characteristics' (Rittel in his lectures on Design Theories and Methods, and quoted in Protzen 2010, 1).

However, most planning theorists at the time, particularly those promoting Marxist and critical planning theories, were sceptical about the possible contributions of master planning to the future of planning thought (Sanyal 2008). They saw master planning as part of the problem of urban inequalities, rather than a way to offer a solution. They considered it to be apolitical, while the radical planning ideas that they promoted placed politics at the heart of the process. Furthermore, critical and Marxist theorists saw design as based on the individual's intuition, lacking the rigour and analysis of the social sciences, from which they drew their ideas. Lastly, they thought that urban designers²⁸ and architects naively believed in reverse causality – that just as the built environment is influenced by social and economic forces, these forces can be impacted by change in the urban form (Sanyal 2008).

²⁸ The new name given to the discipline of physical design, to be reviewed later in the Chapter.

As planning theorists became increasingly concerned with socio-economic and political systems, their focus also shifted toward the transformative change that they believed could come only from social movements on the ground. They dismissed master planning as a simplistic, visual and aesthetic exercise, and at the same time, rejected the very idea of planning problem solving: 'To think of designing as "problem-solving" is to use a rather dead metaphor for a lively process and to forget that design is not so much a matter of adjusting to the status quo as of realizing new possibilities and discovering our reactions to them' (Jones 1992, xxix). Design theorists became increasingly concerned with the individual's cognitive processes as they make sense of things and create meaning through complex questions (Buchanan 1992; Cross 2001, 2011; Lawson and Dorst 2009; Lawson 1980; Krippendorff 2006). Each of these ways of thinking about design also offers insights into the layers of complexity are associated with its study: for instance, unpacking formal reasoning and processes from personal intuition and informal collaborations; following reflexivity and uncertainty; the development of hypotheses for exploration and contextual exercises of sense making; methods of symbolism and communication; materials and skills (Jones 1992; Shirvani 1985; Çalışkan 2012).

In 1983, Donald Schön published his seminal book *The Reflective Practitioner* in which he draws from the ideas of Dewey (1933), Lewin (1951) and Piaget (1932), to develop reflective theory. Schön promoted a process of continuous learning through the individual practitioner's ability to think about their own practices. His

work integrated theory and practice in a cyclic pattern of learning from experience and the application of knowledge. He defined reflective engagement as a vital mode of thinking, 'paying critical attention to the practical values and theories which inform everyday actions, by examining practice reflectively and reflexively. This leads to developmental insight' (Schön 1983, 102). Engaging practitioners with a tool through which to conceive of practice-based learning shifted the conception of learning and knowledge away from purely formal and explicit structures to a notion of informal and implicit personal thought processes.

As reflective practice became a mode by which planning practitioners and theorists engaged in discourse, planning theory in the 1990s turned to communicative or collaborative theory based on the idea that knowledge is socially constructed (following Berger and Luckmann 1966). The role of the planner was to facilitate and mediate between different stakeholders to form consensus-building, based on Habermas' theory of communicative action (Habermas 1979, 1983, 1990), and Foucauldian theories of power (Flyvbjerg 1998; Flyvbjerg and Richardson 2002; Foucault 1979, 1980, 1984). The idea behind communicative planning theory is that the problem definition, the solution, and the methods used, require negotiation and collective forms of meaning-making, or sense-making (Forester 1985). According to these theorists, planning thought should incorporate multiple understandings and promote discursive social practice. The planner is repositioned from being at the centre of relations to a more contingent position within multiple relationships, working to achieve purposes by creating new connections and shaping existing ones

without certainty as to the eventual impact (Healey 1997, 2006; Innes 1995).

Among the many criticisms of the collaborative approach is its focus on theory rather than applied practice, failing to explain how to make the leap from conflict to consensus, and how to address complex planning situations that require expert knowledge beyond what participatory methods can provide (Allmendinger 2002a). Despite this limited practical application of the communicative turn, its theoretical influence has been far-reaching, challenging any attempt to smooth over difference, uncertainty and complexity with linear or cyclical models of planning processes.

Following from the communicative approach, planning theory has drawn from complexity theories in the social sciences, attempting to find ways to address and intervene in urban complexity and uncertainty without simplification and homogenization (Balducci et al. 2011; Christensen 1985; Pearman 1985; Zandvoort et al. 2018). It is at once a concern with the philosophy of planning, with how planning is practised, and how it ought to be applied, and at the same time an ongoing effort to map a position for planning in social, spatial, political and economic urban systems that are now understood as open, dynamic and perpetually out of equilibrium (Albrechts and Mandelbaum 2005; Albrechts 2010; Batty and Marshall 2012; see de Roo, Hillier, and Van Wezemael 2012 for an in-depth review of complexity and spatial planning). Bertolini (2006) summarizes the key characteristics of complex systems as constituting multiple components and relationships of variables, eschewing any notion of linear and direct causality, path-dependence and predictability. This thread of planning theory has challenged how

scholars conceive of planning in general and planning thought in particular, to make room to consider the multiplicity and uncertainty planners incorporate in their methods. The next section looks at how scholars re-contextualize planning thought in shared cultural frames.

Cultural

The 1990s brought a cultural turn in planning theory with the development of postmodern critical studies. *Culture* was perceived as plural, fragmented, dynamic and reflective, and *planning* as a culturally determined process (Booth 1993, 2011; Sanyal 2005a; Soja 1989)²⁹. Since then, planning culture has become a significant phrase in the discipline's debates and a review of the literature, as explored in the following sections, reveals three main cross-cutting implications. First, there are disputes on what *planning culture* means, and how its prominent dimensions should be defined. The literature covers a range of phenomena, often contradictory, and the lack of coherence compromises its potential significance (Fuerst 2009; Pallagst 2010; Taylor 2013). Second, no matter what the approach, these diverse endeavours mark a clear move away from the conception of an individual cognitive schema towards a social practice. Third, approaches in planning culture research place emphasis on the importance of comparative study, for the

²⁹ This review draws the line at analyses that have focused on the idea of sensitising planning to cultural plurality or diversity (Young 2008, 2012), or the increase in literature on 'cultural planning' including urban planning for education, the arts and sciences (Evans 2002).

purposes of studying difference, emphasizing common ground, and asking why planning is practised the way it is.

The following section reviews planning culture scholarship by laying out existing divides in the literature and identifying a possible juxtaposition. Three corresponding environments of practice emerge; national, professional and workplace planning-culture discourses, respectively, are conceptualized and studied. This review identifies a gap in the literature that reveals an anthropological field, offering a new conception of *planning cultures*, and responding to some planning and planning cultures writing that refers to the need for ethnographic research and *thick description* of everyday practices, to draw theory from praxis, and strengthen their ties (Fischler 1995; Hajer and Laws 2009; Othengrafen 2012; Sandercock 2005). Though ethnographic work has been conducted on practice, observations have generally taken place during meetings and interactions between parties, rather than in everyday practices in office environments (Grijzen 2010; Hartmann 2010; Othengrafen 2012; Rapoport 2011). Furthermore, much of the ethnographic work removes culture as the variable of study, focusing rather on the description of a specific project, site, or actor through planning questions.

Planning literature generally considers culture to be an organizing device embedded in a national system - one that if unravelled may lend itself to decryption (Fuerst 2009; Knieling and Othengrafen 2009; Sanyal 2005b). It builds on a research history

that aimed to find ways of characterising those features of planning systems that are at once specific to a place's traditions, modes of practice and institutional frameworks as they govern spatial development, and comparable for the purpose of learning and transfer (Larsson 2006; Newman and Thornley 1996). This has been a particularly growing field of interest in the context of globalization in general and international governance institutions practising cross-border development and planning in particular. The European integration process has proliferated a discourse on planning culture with the objective of increased cooperation toward a 'balanced, polycentric, sustainable and competitive development of its territory through spatial planning techniques' (Territorial Agenda, EU 2007, quoted in Othengrafen 2012, 31).

Two key approaches may be identified, though most literature does not distinguish between them. One approach examines culture as a context that informs practice. Seeking a systematic framework for cross-national research through which to identify potential best-practice benchmarks for learning and policy transfer, much work considered planning as it is embedded *within* a culture composed of a national, social, geographic, historical and governance context, focusing on formal planning mechanisms and institutional arrangements (Knieling and Othengrafen 2009; Newman and Thornley 1996; Young 2008). Despite the cultural turn of the 1990s that saw planning as a 'culturally determined process in which the interaction of decision-makers and the meaning they assign to the instruments they use will affect the outcome' (Booth 1993, 219), much of the research using this approach

draws from early works of Friedmann which interpreted culture as the *decision environment* in which planning operated (Friedmann 1973a). This environment included elements such as ‘the number and diversity of organized groups and their relative power, the degree of tolerance for political opposition, the role and characteristics of private enterprise, the availability of information, the structure and performance of bureaucracy, educational level, and the degree of system turbulence’ (Faludi 2005, 286). In a similar vein, Bolan’s *cultural envelope* comprised the formal-legal structure, informal structure and the characteristics of a polity (Bolan 1969).

A break in this literature came in 1993 when Keller, Koch and Selle published a study of four national *planning cultures*, addressing the social contexts of interpretations, objectives, fundamental beliefs and values as they form perceptions (Keller, Koch and Selle 1993³⁰ as referenced in Friedmann 2005 and in Keller, Koch and Selle 1996). To accomplish their study, the researchers conducted a survey among planners in Switzerland, Germany, France and Italy. The context, as they define it, is composed of three levels, comparable to Friedmann’s rationalities: organisations, judicial and administrative structures; tasks and objects of planning and planner’s perceptions; and fundamental beliefs, values, and orientations (Keller et al. 1996, 42). More recently, investigations have been compiled to investigate

³⁰ The original publication was published in French, German and Italian and was not sourced for this paper.

how national cultural roots affect planning practices across Europe, wherein ‘urban and regional planning and development are strongly rooted in and restricted to the cultural contexts or traits of a society’ (Knieling and Othengrafen 2009, xxiii).

In building his theoretical framework, Othengrafen clarifies his search for a systematic comparative approach through which to analyse the role of culture in planning practice. Here, planning culture is considered an aggregate of social, environmental and historical contexts, as traced through the ‘lived experiences and activities of planners, including their interactions, products and impacts on the built environment’ (Othengrafen 2012, 3). Othengrafen returns to Booth’s original statement and aims to study the ‘unconscious everyday routines and underlying practices in planning’, ‘the unexpressed points of view, traditions, paradigms, cognitive frames, and philosophies that underlie the “technical knowledge” of spatial planning’ (Othengrafen and Reimer 2013, 1270). He also refers to Friedmann’s triad of rationalities to propose a *culturised planning model*, made up of three cultural categories for analysis. The first he terms *planning artefacts*, defined as perceivable policy solutions, plans, structures and processes, as symbolic representations of deeper levels of planning and ideals. The second is the *planning environment*, through which to consider the shared assumptions, values and cognitive frames of planning professionals. Third is the *societal environment*, the social and political norms and values, which he traces as national in scope.

This last category becomes a guiding framework for his research methods and analyses; the significance of the national becomes a dominant factor in choosing to interview planners in different countries and forming semiotic analyses that turn to generalizations. It is possible to read this type of analysis throughout his research, for instance in the statement:

It also becomes apparent that the master plan in Cologne-Bonn, by including manifold actors and topics as well as by considering different statutory spaces, pursues a spatially inclusive and comprehensive approach (*planning artefacts* and *planning environment*). Closely related to this are the principles of thoroughness and accuracy (*societal environment*), which seem to play an important role in German society to avoid uncertainty and insecurity. (Othengrafen and Reimer 2013, 1277)

Throughout Othengrafen's research, the unconscious everyday and analysis of artefacts are almost seamlessly linked to characteristic cognitive tropes that form the cultural context.

The second standpoint in planning cultures discourse considers planning as constituting a culture in and of itself, investigating planning cultures as a study in change - asking how it has evolved in response to geographic, political, social and economic transformations. At the forefront of this research has been the Massachusetts Institute of Technology (MIT), with a publication edited by Bishwapriya Sanyal (2005), entitled *Comparative Planning Cultures* following a conference of the same name. In his introduction, Sanyal defines planning culture to mean 'the collective ethos and dominant attitude of professional planners in

different nations toward the appropriate roles of the state, market forces, and civil society in urban, regional, and national development' (Sanyal 2005, 3). He asks whether there exist differences in planning cultures in different nations, how planning cultures are formed and how they have evolved, noting the importance of contesting essentialist conceptions of culture that can evoke a sense of obduracy, inheritance and inevitability. Sanyal rather places importance on the continuously changing nature of cultural elements, particularly through the social transformations occurring in contexts of neoliberalisation, globalization, technological advances, etc, both within and beyond geopolitical borders. The collection comprises eleven case studies or stories of how different countries have coped with change, and each writer attempts to decode a culture of planning thought.

Unsurprisingly, the definitions of planning culture differ between chapters depending on the researcher's chosen theoretical framework, however it is possible to consider a comparative overview by examining the parameters through which change is captured. Time and space are the prevailing organizing dimensions through which the study of change, and thus of culture, is investigated throughout the collection. For example, in his writing on planning culture in Iran, Tajbakhsh traces the changing notions of what he terms 'the legacy of traditional decentralization' through four different epochs of reform until the nineteenth century, and across the country's geography, forming centre-periphery relationships characterized by a weak state and a weak society (Tajbakhsh 2005,

88). He draws a historical and spatial pattern of 'oscillation between attempts at centralizing power and then a long period of loosening up, with greater autonomy achieved by the provinces' (*ibid.*, 69). The Chinese case of planning culture as presented by Leaf, for instance, considers urban settings as related directly to the notion of Confucian statecraft, Maoist urbanism and contemporary hybrids. This links contemporary practices of territorial, administrative and economic orders, marked by the cellularity and regularity of space, directly with philosophical and political outlooks of the past through which the integration of state and society functioned (Leaf 2005).

Essentialist ideas on national planning cultures are contradicted by historical studies that reveal urban planning to be 'an international movement with different national expressions' (Ward 2013, 37). Although planning may have originated as national and urban interventions, clearly demarcated planning cultures can only be studied in absolute national terms at the very onset of planning practices, after which a rapid cross-boundary dissemination of technical knowledge, ideas and values was shared among practitioners as part of their growing professionalization (Ward 2013). With technological advancements in transport and communications in the late nineteenth and early twentieth century allowing increased international travel of both people and knowledge, as well as relatively few travel formalities prior to 1914, planning developed as an internationally mobile movement. Western practices were further globalised through colonial and post-colonial mechanisms.

The expanded range of ideas and practices that had become available to individual cities and countries brought about, according to Ward, an *international patchwork*: 'It was possible to find American and Swiss planners playing important planning roles in 1950s India. Meanwhile, a Greek planner planned the new capital of Pakistan and British planners worked in what became Bangladesh (then East Pakistan). Soviet planners worked in Vietnam, and, for a time, Indonesia where there were also Danish and British planners at work...' (Ward 2013, 49). The list goes on. Furthermore, international associations and organizations - such as the International Federation of Housing and Town Planning (1913), the Congress International d'Architecture Moderne (1928), and UN Habitat (1951), for example - promoted their visions of good practice among practitioners. To this day, the development of planning's global reach continues: the travel of ideas through international meetings, online forums, and planning schools, as well as the geographic mobility of planners themselves searching for new projects, collaborations and clients, creates new links across national boundaries (see for example Rapoport 2011).

This branch of planning literature shifts the cultural boundaries in question from geopolitical to professional. One view interprets planning theory as the foundation of a common language and shared intellectual framework through which planners construct a sense of social and professional identity (Fischler 1995; Forester 1996; Hoch and Cibulskis 1987). As Healey argued:

Every field of endeavour has its history of ideas and practices and its traditions of debate. These act as a store of experiences, of myths, metaphors and arguments, which those within the field can draw upon in developing their own contributions, either through what they do, or through reflecting on the field. This “store” provides advice, proverbs, recipes and techniques for understanding and acting, and inspiration for ideas to play with and develop. (Healey 1997, 7)

Schon and Rein (1995, 205) state that planners obtain a ‘usable repertoire of unique cases’ that guide their actions, particularly when confronted with a new situation.

Fischler (1995, 175) further contends that to understand planning theory as an ‘evolving part of planning culture’ it must be examined within the study of planning history. Krueckenberg’s (1983) *Introduction to Planning History in the United States*, for example, charts a history of movements and schools of thought, portraying a culture of planning that renders it distinct from other professional practices, a unitary culture constituting multiple voices and ideas.

Some scholars are more discriminating in emphasizing personal disparities among planners. Clara Greed’s studies of women in planning and surveying professions resonates with the notion that the discipline is composed of a collection of various subcultures as related to social identities such as class, gender, race, religion and social movements (Greed 1994a, 1994b). Emily Talen’s work on American urbanism traces four individual and interdependent cultures created by contested disciplinary affiliations and epistemic communities with which individual planners associate themselves (Talen 2005). The plurality of meanings and histories associated with

planning's different schools of thought can also be ascribed to variations in educational backgrounds, as planning is taught in design, policy and administration, and technical schools (Freestone 2012; Freestone, Thompson, and Williams 2006; Talen and Ellis 2004). In his historical study of the creation of urban freeways in America, *Professional Conflict over Urban Form*, Ellis (1996) considers the planning profession as made up of subcultures of engineers, urban planners, landscape architects, developers, and other actors involved in planning processes, as they produce and share worldviews guided by their education and shaping their design proposals. Every subculture generates its practices through its own norms, values and knowledge, viewing freeways as 'traffic conduits, urban architecture, land-use boundaries, economic stimuli, redevelopment catalysts, and tools of social policy...' (Ellis 1996, 263).

In a study of planning culture in Mexico City, Davis (2005, 194) states that the different views expressed by planners emerges not only from their different training and professional references, but 'also depends on the extent to which these varying professionals are embedded in divergent local, national, and international communities, cultures and classes and thus hold different views of whether the aims of state, the market, or civil society should prevail'. His work begins but stops short of framing planning culture and subculture research as relating to the organizations in which the planner works, what sector they belong to and for whom they plan. It is possible for a planner to work for the state at local, regional or national levels, in the non-profit sector at any of those levels, or in the private

sector serving the company's own interests or as an independent consultant employed by both public and private clients. The location from where a planner acts impacts intellectual commitments, shapes practice, and defines the contours of planning history. Each of these locations conditions the planner's range of possible actions (Baum 1983; Hoch 1994). For example, Davidoff's (1965) advocacy planner works in opposition to government and other powers of authority: planning is overtly political and shaped by the advocacy work that the planner conducts for his or her constituents. Despite the diversity in planning practices, and ideas on subcultures, there has been little analysis of planning as explored through immediate workplace contexts, and planning culture as conceptualized through the significance of location, comparative or otherwise (Hoch 1994; Kudva 2008; Rodwin and Bishwapriya 2000).

Neema Kudva (2008) presents a case for planning as an activity shaped by location, stating that as a theoretical terrain, location is a far broader notion than any other of her encounters as a researcher. She explains that location must be perceived of in a way that retains usefulness across contexts, in sharp contrast with those that seem dedicated to the capture of difference. She therefore presents location as more than a geographic term, scaling the notion of context first to the individual planner, their personal and professional history, identity and culture, and then to the workplace as it forms an ongoing relationship between practice, learning and the generation of knowledge. As such, her definition of location cuts across other boundaries of professional and academic planning practice including domestic and

international, the global north and south, and the traditional separation of history, theory and practice. Each of these relationships is shaped in large part in the day-to-day work of communities of practice within which planners work, live, study and conduct research (*ibid.*).

Kudva's study refers to Brown & Duguid's definition of communities-of-practice as:

[G]roups of interdependent participants [that] provide the work context within which members construct both shared identities and the social context that helps those identities to be shared. Mediating as they do between individuals and large formal and informal social structures, they are where a good deal of the work involved in knowledge creation and organizational learning gets done. (Brown and Duguid 2001, 203 in Kudva 2008, 367; see also Friedmann's 2005 *community of planners*)

This mediation means that through the site in which a planner's work is embedded, within organizations, it is possible to identify relationships between global planning theory and practice, and individual planners, 'without reducing one to the other' (Kudva 2008, 367; see Krueckeberg's (1983b) biographical studies of planners and Forester's (1996) practice stories). Furthermore, it creates a framework through which to consider the collective practices and experiences of planning, as it is never a solitary endeavour. According to Kudva, this kind of study has the potential to build the capacity for critical inquiry clear of abstract accounts, and without choosing between theory and practice, or which should come first. She emphasises that work locations structure and legitimate different concerns, types of thought

processes and knowledge, and professional values, as well as validating career variations.

Dana Cuff's (1992) study of architectural practice presents a clear case in support of Kudva's definitions of the importance of location in shaping shared culture. Cuff's work is based on participant observation inside architectural companies, studying the complex social organization of the culture of architectural practice. Spending six months in three different design offices, observing seventy-nine individuals at work and then another six months conducting interviews, she unpacks the social construction processes of architectural practice. Her analysis of situated and collective actions, and constructs of meaning, draws from routine actions and experiences across the different career stages of individuals. She analyses the process of becoming an architect through strategies of socialization and legitimization. Cuff is able to make visible the invisible of everyday work, which usually remains unstudied until it becomes either problematic or heroic - when the process has elements of either massive failures or great successes. She emphasizes the disparities between what architects do and what they say they do, showing how interviews cannot simply capture practices, that viable and reliable data must be formed from the combination of self-reports and the observations of an outsider.

The resulting study is thick and difficult to summarize, but it is possible to highlight two key lessons learned. First is the understanding of social organization as the

context of interactions from which that design emerges - framing design questions, dilemmas, and solutions. This type of work is a constant mediation between individual and collective processes, as they form collaborative practices: the individual's imagination, choices and processes and the constructions of social intelligence feed one another (Greed 1994b; Mukerji 2009; Rittel 2010 [1987]). Cuff firmly embeds her unit of analysis in the workplace focusing on the social relationships and exchanges that constitute the practice as a collective and collaborative task. Importantly, she does not imply that the profession itself constitutes a culture, nor that hers is a study of the culture *of* the workplace. By telling the story of practice from the group members' points of view, the second lesson learned is that everyday practice can be perceived as fluid, and that designers think through simultaneous and dynamic relationships between design problem definition, formulation, and solution, or as Cross has argued on design thinking, '[i]n the process of designing, the problem and the solution develop together' (Cross 2011, 7). Cuff highlights an 'implied linearity of procedures' that easily masks the perpetual nature of design and generate seeming rationalities (Cuff 1992, 95). A similar conclusion is drawn in Forester's *Practice Stories* (1996), emphasizing how planning practices conform to constraints in time, budget and resources, and that in order to uncover the nonlinear experience of planning practice, a researcher must draw from personal narratives. This requires a research and analytical framework that can grasp change of values, ideas and concepts, across practices that are often overshadowed by accounts of linear and rational processes.

The literature on planning cultures recalls Friedmann's triad of rationalities discussed earlier. Each of the three approaches takes culture as the boundary or container in which planning is practised, guiding planning thought. It leaves a gap to explore culture as the variable shaped by practice (Douglas 1986). Furthermore, there has been little ethnographic research dedicated to the internal practices of teams of planners as they actively define master planning in their everyday practices within organizations (Hoch 1994; Rodwin and Bishwapriya 2000), although there is an increasing interest in studying forms of practice (Flyvbjerg 1998; Kurath et al. 2017; Rydin and Tate 2016; Throgmorton 1996; see Watson 2002 for a review). Before addressing these gaps, in the following section I consider the relational stream of planning literature that has helped to shift recent approaches to how planners think.

Relational

Abram (2016, 654) critiques the use of the term culture in planning literature, stating that '[t]he key problem is the tendency to see culture as a thing, or a set of attributes, something concrete that can be measured, compared and manipulated. This itself derives from a strong European tradition of externalising culture as an object and treating "it" as an objective fact'. She opposes the notion that the complexity signified under the heading of planning can be given a unified and ordered framework, particularly 'with an idea as complex, messy and unpredictable as "culture"' (ibid.). In her own ethnographic research, she applies anthropological

concepts to planning studies to explore assumptions embedded in practice.

Abram's research uncovers divergent views and interests, relating different temporal and spatial frameworks to form a single relational field, unifying the elaborate nature of planning as a concept and practice.

The last decade has seen an increase in relational thinking on urbanism which has brought with it conceptually new approaches to planning theory (Healey 2006, 2007; Jacobs 2012; Meyer 2013). A relational view of the planning, draws from urban studies in Science and Technology Studies (STS) (Farías 2011; Hommels 2005), to consider practices as they emerge from relationships between social and material entities (Kurath et al. 2017).³¹ Planning is seen to enact the urban complexities on the ground and mitigate the multiple voices and formal and informal processes that make up practice.

Planning scholars have increasingly explored the significance of the material turn in the social sciences (see Mukerji 2015) as an avenue to describe and analyse planning practices. They note a concern that, so far, planning theory has acknowledged the physical world only as a passive context or consequence of human actions, but has not explored its role in shaping practice (Beauregard 2012, 2015; Lieto and Beauregard 2015; Rydin and Tate 2016). Rydin (2014) summarizes

³¹ This stream of planning literature draws from the relational philosophy of Deleuze and Guattari (1988) and De Landa (2006). See Müller and Schurr (2016) for discussion.

four ways in which planners interact with materials: planners operate day-to-day in physical environments in the workplace; they relate to the built environments with which they are engaged in a planning process through material documents that mediate their encounter; they generate artefacts; and they interact with the physical environment and site. In describing the artefacts that planners make, she defines planning as a having a 'highly mediated and somewhat divorced relationship with the materiality of the environment', through these objects, as they embody and hide 'mechanisms of calculation' (Rydin 2014, 592). She refers to survey reports, land use plans, urban design statements, etc., as black boxes, as they invoke a system of behaviours, thoughts and perceptions that are closed, inaccessible and stabilised in sociomaterial relationships (Callon 1980; Callon and Latour 1981; Rydin 2012, 2014). However so far, the literature focuses more on the material of the built environment, or the use of planning artefacts, but not on the making of artefacts as internal planning practices, creating a clear gap for this thesis.

Materialist analysis provides a theoretical lens through which to reassess the role of the planner. Rydin (2014, 593-4) has described it as:

[T]he de-centring of the planner as a key social actor from a central position with governance networks [...] to a more contingent position within multiple sets of associations, working to achieve purposes by the small work of creating new connections and shaping existing ones without certainty as to the eventual impact.

Many of the material studies of planning have been based on Bruno Latour's and Michel Callon's Actor-Network Theory (ANT) (Callon 1986, 1991; Callon and Latour 1981; Latour 1986, 1988, 2005, to name a few), which describes how both people and things can instigate changes in a network of simultaneous relationships (Lieto and Beauregard 2015; Farias and Bender 2010; Rydin and Tate 2016). Latour (2005) explains that the network is a method or device through which to study the dynamic ways in which socio-material relations are negotiated, rather than a thing to be uncovered. The ANT approach constitutes a controversial shift in the unit of analysis, away from planning theory's more traditional focus on planners' intentionality and decision-making processes (Boelens 2010).

ANT studies in planning range in scale and size from meeting minutes, heating systems, green buildings, to railways and highway junctions, among other things, and looks at how things and relations are continually in the making (Rydin and Tate 2016). Ways of thinking are also not stable categories but, rather, are embedded and enacted in everyday practice (Latour 1999; 2013; Law and Lien 2011). ANT studies provide a means to study both formal and informal development mechanisms, revealing a composite study of planning and charting the relationships that actively shape networks (Farah and Teller 2012). As Rydin states: 'Planning activity involves a range of actors and actants³² interacting, engaging with each

³² In ANT, the term 'actant' is used to extend the meaning of 'actor' in a network from being purely human, to including nonhuman entities (Rydin 2012; Latour 1996, 1999; Callon and Latour 1981; Mol 2010).

other (a rather neutral term), enrolling each other (a less neutral term) and producing outcomes which are a mix of the desired and undesired, the intended and the unintended consequence' (Rydin 2010, 265).³³

Perhaps one of the most controversial claims for planning theorists engaging with ANT is the claim that, in any situation, social and material forces are to be treated as equally relevant, or symmetric, that both possess agency distributed across their network of relationships. For some planning scholars, attributing agency to material artefacts dangerously reduces the politically fraught decision-making responsibility of planners. However, recent studies show that by distinguishing the intentionality of planners from the agency of actants, leads planning theory to a renewed engagement with social practices, motives, values and professional ethics as materially mediated but not reduced (Rydin and Tate 2016).

Planning scholars also question whether ANT has created a shift in how planning thought is perceived. Beauregard (2015) asserts that while studies are explored in more complex and dynamic terms than previous frameworks may have allowed, most of the research continues to focus on problems and problem-solving with

³³ For Boelens (2010), his actor relational approach (ARA) relies on ANT to generate an analytical framework as well as an action tool in complex planning practices, where objects may *author* networks by bringing up issues that instigate social action.

materials as intermediaries and calls for further studies of how planners contemplate their everyday practices.

While ANT descriptions enable analyses of how different actants influence plan making and implementation, studies often foreground the network morphology. Fowles (2010, 25) states that ‘this new materialism tends to blind us to that more complicated world of relations in which, packed between the multitudes of self-evident things, are crowds of non-things, negative spaces, lost or forsaken objects, voids or gaps – absences, in other words, that also stand before us as entity-like presences with which we must contend.’ The relational view of planning as told through ANT, on the one hand, captures complexity by tracing entities through manifestations of processes between things that are present, physical and tangible, and on the other hand, hides the importance of relations between things that are intangible, absent or implicit. How planners think becomes part of the network only when thoughts materialize into things.

Anthropologists, however, have a tradition of a relational approach to cognition in which the social and material engages with concepts of time and space, values, implicit meanings and perceptions. The relationship between cultures and the objects in their built environment is regarded as an intrinsic and integrated part of social life and organization; built forms are seen to reflect the cultures that produced them (Arensberg 1988 [1937]; Rapoport 1969; Rodman 1993; Rotenberg 1984; Rykwert 1988; Wylie 1974 [1957], to name a few). Pierre Bourdieu (1977

[1972]) argues that the morphology of cognition is not an *a priori* assumption, but rather a thing to be studied as enacting relationships. He demonstrates how people and practices are ordered through the assignment of places and times in the home, for instance how the interaction between women and the home shapes and secures their role in social order.

Perhaps due to the nature of ethnographic research, the evolution of urban anthropology, and the focus on the social construction of space by communities, some of anthropology's imaginaries of planning are located in the gap between top-down planning and the lived experience, the distance of planning from the realities on the ground (see Jasanoff and Kim 2015). The complexity and multiplicity of urban environments, as well as their highly contested spaces and unresolved conflicts, makes cities an ideal arena in which to study the symbolic reproduction of identities, connections and disjunctures (Low and Lawrence-Zúñiga 2003). This coupled with the traditions of anthropology to engage in the critical research of unexamined assumptions and problematizing them, means that 'disjunctures' could be a way of writing an anthropology of planning: the state versus the people, the people versus the market, top-down versus bottom-up, industrial versus vernacular, rational versus communicative planning, among others. As such, much anthropological research in planning emphasizes discontinuity; studying the anxieties, tensions and conflicts at the interface of experience on the ground and reductionist, representative thought processes of planners (Epstein 1973; Herzfeld 1991; Holston 1989; Low 1996b; Rabinow 1989; Peattie 1968; Weszkalnys 2010).

However, Abram's relational studies of contemporary planning portray a firm move away from the notion of a single rationality being able to explain planning thought and practice. Her inquiries investigate the routines and events by which plans are formed, exploring relationships between resources, people and values as they generate plans and organize possibilities and limitations (see Abram and Weszkalnys 2011). She interprets, for instance, how municipal organization and activities are engaged in an ongoing fragile equilibrium of time management, layered through bureaucratic rationale and related to the political hierarchy with time frames ranging from the near and concrete to the distant and more abstract visions (Abram 2013, 2014).

Planning studies in anthropology thus emphasise the importance of considering both the tangible and the intangible (Abram and Cowell 2004; Abu-Lughod 1975). In their book 'Elusive Promises: Planning in the Contemporary World', Abram and Weszkalnys (2013, 3) highlight the future-oriented quality of planning thought, wherein 'the future promised in plans seems always slightly out of reach, the ideal outcome always slightly elusive, and the plan retrospectively always flawed'. In other words, inherent in how planners think are modes of perceiving and overlooking, grasping at the relationship between the material present and imagined intangible futures. The irrational or messiness of planning practices, situated planning thoughts and complex planning cultures highlight patterns of possibilities, constraints, and social and material imaginaries (Abram and

Weszkalnys 2013; Abram 2011; Suchman 1987). Overall, the relational approach locates planning thought within contingent and dynamic planning environments.

Distributed Cognition

In the proceeding paragraphs, I consider how a distributed cognition approach juxtaposes the three conceptions of planning thought previously discussed while responding to the literature gaps that remain. The existing frameworks – morphological, cultural and relational - through which planning thought has been studied have each focused on different dimensions – the cognitive, value-driven, and social, material and organizational aspects of practice. This thesis questions whether individually they are capable of informing an adequate way to study planning thought within the collaborative activity of planning as situated practices. I propose that distributed cognition offers an understanding of the collaborative level of analysis, conceiving of thought (problem solving, decision making, assuming, predicting, knowing, and so on) as inherently social and material practices (Hollan, Hutchins and Kirsh 2000).

The morphological approach, as explored in the first section of this chapter, associates planning thought with two main qualities. First, that the cognition of planners is a malleable form belonging either to individuals or highly cohesive groups, that can be controlled and changed. Second, the assumption seems to be that planning practitioners share a shape of thought that, in turn, defines the

boundaries and values of planning as a social institution. The brief overview provided of the evolution of the scholarship on morphologies of planning thought reveals that it has become increasingly conceived of as multiple and complex. The domain of thought, however, remains largely unspecified or decontextualized. This literature does not engage with questions concerning where thinking happens, though one may assume it happens within an intracranial mind (as in Figure 2.1). The abstract analyses that appear in charts (Figures 2.2 and 2.3) present thought as isolated from social processes, and behind their neatness activities of planning remain hidden (Suchman 1987).

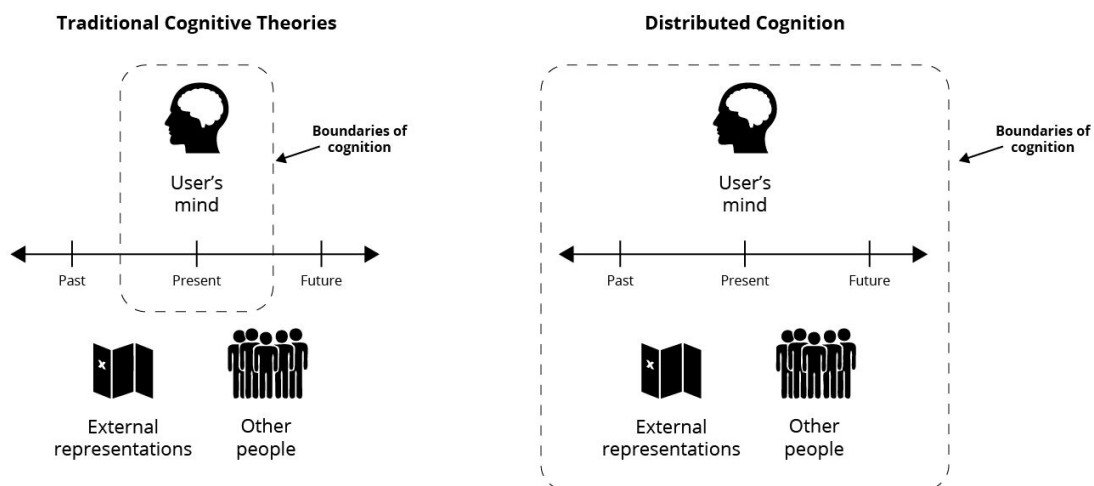


Figure 2.4: Morphologies of cognitive systems
Source: <http://mattsoave.com/misc/hcde501/dcog.html>

In contrast, the morphology of a distributed cognition approach is defined at the boundaries of the cognitive system (Figure 2.4). While traditional cognitive studies concentrate on the thinking and activities of individuals in a present timeframe, the study of a distributed system attends to how sense making emerges between people, materials, their spatial environments and temporal perceptions (Hollan,

Hutchins and Kirsh 2000; Kronenfeld 1996; Suchman 1996; Suchman and Trigg 1991). A distributed approach frames cognitive processes as situated inside a sociomaterial, organizational context of activity. It recognizes that thinking is not done in isolation, and is distributed across practices of people, artefacts and their environment interacting in practice. The aim of this approach is to discern how shared understandings are formed and shaped to enable a cognitive system to coordinate practices achieving a certain task (Flor and Hutchins 1992; Hutchins 1995a, 1995b; Nardi and Miller 1991; Nardi 1996a, 1996b). As David Kirsh (2006, 258) explains:

The study of distributed cognition is very substantially the study of the variety and subtlety of coordination. One key question which the theory of distributed cognition endeavours to answer is how the elements and components in a distributed system – people, tools, forms, equipment, maps and less obvious resources – can be coordinated well enough to allow the system to accomplish its tasks.

Distributed cognition does not presuppose linear or cyclical modes of thought, nor does it relinquish complexity to perceptions of disorder and irrationality. Within the border of a cognitive system, the approach eschews single forms or formulae of thoughts. The focus is on the everyday practices as they enact cultural processes. This approach leaves open questions concerning possible orders and processes of cognition, including interpretations of multiple simultaneous processes that may contribute to wider ecologies of practice (see Law and Mol 2002; Mol 2003; Stengers 2013).

The cultural approach in planning literature, as reviewed in the second section of this chapter, considers culture as a stable context, the driver of cognition, or the framing of commonalities, all allowing for comparisons to be made between them (Abram 2011; 2016). It seems to provide an alternative morphological condition as culture is conceived of as a frame or container of thought. In a distributed cognition framework, however, culture is a dynamic variable to be studied. Within practice, the cognitive system adjusts through processes of sensemaking, engaging and ordering processes of perceiving, understanding, and forming knowledge. This resonates with Mary Douglas's dynamic approach, offering 'an institutional explanation of culture, not a cultural explanation of institutions' (6 and Richards 2017, 90). Douglas argues that culture is cultivated by social thought, beliefs and behaviours and is dependent on social organization within institutions.³⁴ In her book *How Institutions Think*, Douglas (1986) explains that categories of thought are defined within social groups and serve as the social foundation for cognition. Her argument is not that institutions are capable of thought as humans are, but that as people construct their institutions, their ideas are moulded together into a shared order, which pattern rationale and complex worldviews. Ideas about the world are enacted towards achieving shared meaning and coordination (Douglas 1986; see 6 and Richards 2017; Weick 1995; Garfinkel 1967). In the distributed cognition framework, cultural processes are perceived through the active coordination of practices and emerging relationships (Dror and Harnad 2008; Harnad 2005;

³⁴ For Douglas, the term institution refers to any social group, formal or informal (see discussion in 6 and Richards 2017).

Hazlehurst et al. 2007; Zhang and Patel 2006). This is not to say that individuals are not considered, however their practices are contextualized within patterns generated in sociomaterial relationships.

The relational sociomaterial approach to planning thought in the literature focuses on dynamic relations between people, materials and their environments in the field. As elaborated in Chapter 1 of the thesis, the distributed cognition approach is particularly fitting for the study of these dimensions. So as not to repeat what has already been stated, I focus here on the key differences from existing literature. The preliminary focus in cognitive systems is on what things have in common that brings them together, allowing for collaboration and shared sensemaking practices. This contrasts with ANT studies that presuppose the existence of separate entities and throughout the network emphasises differences and distances between them. A distributed cognition approach explores practices as phenomena in which relationships are co-constitutive of coordination, enacting the emerging commonalities and differences within a cognitive system, and the boundaries of the system itself. For instance, master planners working on a project engage in collaborative work that enacts the idea of a project, how projects are perceived and interpreted in their organization (Orlikowski 2002). What emerges is a social organizational patterning of attention that defines what is more or less salient (Zerubavel 2015). The focus on cognitive systems as cultural processes allows a reading of how relationships, things, ideas and thoughts come to matter to a social group and the modes by which they are valued and foregrounded.

CHAPTER 3: RESEARCH METHODS

This chapter outlines an exploration of methods used to study how master planners think as a collaborative, coordinated and distrusted system, and answer the main questions of this thesis: How do master planners think? How do they collectively achieve complex tasks? How do relationships between the material and social in everyday practice frame perceptions of time and space? How do perceptions of time and space in turn reinforce or challenge sociomaterial arrangements? What conceptions of master plans and planning practices are made salient?

Abram and Weszkalnys (2013) explain that ethnography is a particularly fitting way to study planning practices, able to capture the different manifestations of what practitioners think to be possible and how they go about everyday practice. In the first section, I consider the methodological framework and unit of analysis that a distributed cognition approach suggests. I draw from the theories of Karen Barad (2007; 2014a) to further elaborate the analytic approach exploring emerging patterns of difference through modes of coordination by which a distributed system develops shared meanings and values (as in Zerubavel's (2015) foregrounding and backgrounding discussed in the previous chapter). In the sections following, I describe my research methods in fieldwork and what transpired in the field, including access negotiations and the signing of confidentiality agreements, participant observation and ethnographic interviews. I consider challenges faced in the field, both in terms of my identity as a researcher and my relationships with informants. In the final section, I discuss how reconciling confidentiality and

anonymity informed my unit of analysis and became embedded in the logic of the thesis.

Methodology

The distributed cognition approach is both a theoretical and methodological guide, through which to analyse complex socially and materially distributed work activities and to study the behaviour of a collaborative system. The main unit of analysis in the distributed approach is the functional system – a collective of people, artefacts and environments in which a particular practice is coordinated. The analytic focus is on various modes of coordination - such as talking, drawing, knowledge and information transfer, organizing and classifying, etc. - as they distribute thinking processes across mental, social and material states of artefacts. Activities are guided, shaped, constrained and adapted in contexts of situated action (Clancey 1997; Suchman 1987). For Hutchins (1995a, xiv), the study and understanding of distributed cognitive systems requires an ethnographic approach with a relatively high level of participation to inform analysis and capture the subtleties of practices ‘in the wild’, or in this case, in the workplace, where everyday practices shape master plans. The detailed focus of participant observation is used to study the subtleties of interactions in a ‘sociomaterial environment of thinking’ (Hutchins 1995a, 289), which necessitates study on an observable and experiential level of analysis.

Several characteristics are attributed to functional systems in the distributed cognition approach. The first is an assumption that any task may constitute a functionally coherent system of activity (Harris 2004; Hollan et al. 2000; Rogers and Ellis 1994; Latour 1995). This assumption classifies the arrangement of practice as constituting an internal schema, such as the navigation of a ship (Hutchins 1995a), inside the cockpit of a commercial airplane during flight (Hutchins 1995b; Zhang 1997), the playing system inside the globe theatre (Tribble 2005), in an operating theatre during cardiac surgery (Hazlehurst et al. 2007), among others. Within each of these systems is a collective approach to a complex task, and at the same time, the possibility that anomalies in coordination may arise, where the systems may not function as desired or expected, or where coordination may falter. The second quality of the functional system assumes that it is highly variable; that individual entities working on a collaborative task engage and enact certain differences between them to achieve their goals. There may be a variable distribution of agency within the system, as individuals may have differential access to knowledge, information and resources, and therefore different possibilities to act.

In attending to the system, therefore, the researcher is required to foreground both the regular and irregular patterns of activity. As part of the methodological framework, I draw on Karen Barad's (2007) theory of intra-action, in which she proposes a method of diffractive readings.³⁵ Barad argues that individual entities

³⁵ See Haraway (1992) for the discussion on feminist diffraction that Barad draws from.

are shaped through their ongoing relationships with one another in entanglements. Agency, or the ability to act, is not something that a single human or nonhuman entities possess on their own but emerges as relational conditions of spacetime mattering. As such, any examination of a phenomenon requires an ongoing reading of intra-action with diffraction patterns, 'patterns of difference that make a difference' (2007, 72), or a 'cutting together-apart' (2014a, 168) as entities and agencies are made and unmade. Barad further argues that entanglements are inherently ethical, as her approach enfolds matter, meaning and values as they all enact relationships and realities, even if always temporarily. These continuously emerging states of incorporate ethics, ontology and epistemology, or ethico-onto-epistemological concerns, that cannot be removed from one another. In this sense how people think, what devices they think with and how they classify and value their own thoughts are entangled.

Barad's approach also has repercussions on the notion of representation within a distributed cognition framework. Hollan et al. (2002, 185) describe how a part of the distributed cognitive system is how people develop and use representations, how 'people often shift back and forth between attending to the properties of the representation and the properties of the thing represented, or intentionally blur the two.' Barad (2003) offers an alternative view of representation that challenges the Cartesian logic in which the things and their representations are separate entities. She argues that the study of phenomena shifts the focus of study from realities, descriptions and translations, to their emerging performative roles, changing the

focus 'from questions of correspondence between descriptions and reality [...] to matters of practices/doings/actions' (ibid. 802).

I draw from Barad's non-representational viewpoint³⁶ as it attends to both the tangible and intangible, to action as well as the absence of action, removing assumptions as to which matters more or less in practice. I argue that methodologically, Barad's theory is able to incorporate future imaginaries and absent spaces and is therefore highly relevant to a study of planning, where planners don't engage with the objects they plan, but they plan the objects they engage with in everyday practice (Beauregard 2015). Attending to patterns of difference allows me to incorporate the things people say, what they mean, what does or does not occur into a single system of activity, rather than assume that absences or anomalies are outside the system (Cuff 1992; Douglas 1966; Li 2005; Scott 1998; Talen 2005; Watson 2008).

According to Barad, the deeply connected way that everything is entangled with everything else means that any act of observation makes a "cut" between what is included and excluded from what is being considered. Nothing is inherently separate from anything else, but separations are temporarily enacted so one can examine something long enough to gain knowledge about it within situated

³⁶ See Ingold (2015), Pickering (1994), and Thrift (2008) for discussions of non-representational theories in the social sciences.

processes of mattering. In my case, therefore, any task that I define as a distributed cognitive system – is not by definition separate from other cognitive systems, but rather is part of an ongoing, emerging ecology. In identifying and separating the coordination and completion of an activity as cut away from other aspects of planning practice, I too temporarily enact a framework for considering how thought is patterned (Woolgar and Lezaun 2013).

The office as an ethnographic field site supposes the workplace to be a culturally bounded space, with a governing ethos, its own rules and codes, behaviours and discourses (Gellner and Hirsch 2001). However, this does not ignore its wider context. On the contrary, the workplace provides a frame of reference for external conditions, and the context is studied as it is internalized, perceived and constructed by office culture, informing responses, resistance, transformations, translations and negotiations through a (or multiple) worldviews. What happens outside ‘provides [the organization] with the aims they pursue and sets limits to the way they may operate’ (Gellner and Hirsch 2001, 4); the outside is enacted and constituted inside. By focusing inside the work setting, ethnography observes the commonplace and the unexpected and can follow events and interactions as they occur (Blau 1955; Buchanan, Boddy, and McCalman 1988; Chambliss 1996; Kunda 1992; Smith 2001).

The study of everyday practice places my field sites within private sector companies. As previously discussed, master planning constitutes a range of placemaking approaches and practitioners with varied professional backgrounds. The field defines what practices are studied and who the research participants are and who master planners are. The anthropological site, as Kuper (1972, 420) describes it, is 'a particular piece of social space, a place socially and ideologically demarcated and separated from other places'. Sites express, enact and define values, as elements within a larger territorial and social systems on the ground³⁷. They link time and space, imaginaries of the past, present and future, whether in suggesting new formations or reproducing old ones. Focusing on the conceptual dimensions of perceptions of time and space, I can consider how they are patterned into practice, enact the wider professional field and are embedded in perceptions of social organization entangled in everyday practice.

I made the decision to conduct participant observation in several field sites to support diffractive analysis. The idea was not to create a framework for holistic narrative on master planning practices (Hage 2005), nor to form a comparative discussion (Strathern 1991), but rather to challenge my own assumptions in a

³⁷ see and Lawrence and Low (1990) for a comprehensive examination of anthropological study of architectural form, and definition of the built environment: '[A]n abstract concept employed here and in some of the literature to describe the products of human building activity. It refers in the broadest sense to any physical alteration of the natural environment, from hearths to cities, through construction by humans. Generally speaking, it includes built forms, which are defined as building types created by humans to shelter, define, and protect activity. They also include the spaces between them as they are defined and bounded, and other defined sites and subdivisions - arrangements, hierarchies, connections, functions, etc.' (454).

process of reflexivity (Bourdieu 2003). I was concerned that I would unintentionally compare any findings from a single field site to my past professional experiences. As an architect by profession and a master planner by practice, I had about twelve years of work experience behind me. I had trained as an architect at the Bezalel Academy of Arts in Jerusalem (1998-2003) and am a registered architect in Israel. In 2006 I moved to Beijing where I worked on large urban regeneration plans, new cities, regional development and the Olympic master plan. I only spent three years working in China, however the long hours and speed at which master plans are made amounted to a lot of experience, albeit very particular to Chinese planning law and culture.³⁸

To distinguish my past experiences with my observations and avoid unconscious comparative modes of thought on my part, I chose to conduct a form of parallel fieldwork. I refer to Ewart's (2011, 8) thesis, *An Anthropology of Engineering*, in which he chose two field sites to distance his previous knowledge and assumptions from his findings, stating '[m]oments of insight in a familiar culture are exposed by experiences in attempting to understand an unfamiliar one and vice versa, the everyday in a familiar culture which may go unnoticed, becomes less comfortably secure and more open to question.'

³⁸ I had moved to London in 2009 to pursue a Masters in Urban Development Planning at The Bartlett, University College London, where I studied a variety of other planning practices, based largely on international development discourse, poverty reduction and social justice. The degree did not give me a background in planning in the British context, nor did it help me conceptualize master planning further, thus leading to my eventual pursuit of the DPhil in Anthropology.

Defining my fieldsites as workplaces allowed me to frame my research at a scale of observable behaviour from which I could consider the different sociomaterial boundaries of cognitive processes such as remembering, reasoning, and knowing as they emerged. Here I could use participant observation as ‘a way of knowing *from the inside*’ (Ingold 2013a, 5; see also 2010a, 2010b), to be part of the world in its ongoing processes of becoming. Reading practices forward helps to shift attention away from the professional accounts of linear methods or iterative logic in design, from implied rational processes and causal connections between intentions, practices and outcomes (Cuff 1992; Forester 1996).

I had originally planned to study master planning companies as the distributed cognitive systems in which planning activities occurred. I had assumed that if I could study the business and organizational dimensions of work, and the planning and design practices in the studios, I could gain insight into the multiple forms through which master plans and the master planning profession cohere (as in Mol 2003). The constraints and possibilities that emerged in the field, however, brought about a different analytic cut, that I discuss in the sections that follow.

Fieldwork Methods

Access and Confidentiality

My initial plan had been to conduct participant observation in three different private-sector planning offices or consultancies for a period of four months each. I sought entry into eleven different firms, with a range of types of master planning practices, including one engineering, two landscape architecture firms, one that practised participatory planning methods, three that specialized purely in urban design, two architectural firms and two whose role in planning processes focuses on the analytic stages of design. To the five who responded with interest, I sent a short curriculum vitae and research proposal approved by the research ethics committee at the University of Oxford and requested a meeting in their offices at their convenience. During discussions, firm representatives - gatekeepers - did not seem to require much convincing of the benefits my research might provide to the master planning discipline and to their own practices (Alcadipani and Hodgson 2009). They perceived the ethnographic method as possibly opening new and external channels of reflexive thought on their practice, including their service strategies, creative processes, converting informal to formal knowledge, ideas on organizing their data and internal communication.

However, as discussions progressed, the firm's gatekeepers expressed more hesitation due to concerns with confidentiality and disclosure (Buchanan et al. 1988; Gellner and Hirsch 2001; Smith 2001). Although I emphasized my ethical commitment to the boundaries of confidentiality, and that both the University and

my supervisor would help to ensure their privacy and anonymity, the representatives of the first firm with whom I met eventually stated that their projects were too sensitive, and would not be able to control what I see and hear because work is conducted in large open spaces with hot desks (staff rotating through the space). The gatekeeper of the second firm expressed a concern with what projects I could study, as most were highly sensitive politically and economically. In a third company, I met with a managing director who put me through an entire interview process, asking me to submit my portfolio and discussing how I could be of use to the firm. After several meetings and email exchanges, it was agreed that I would begin fieldwork once they had moved offices in the Spring of 2016. This was scheduled to be my third and final field site. However, one week before I was due to begin, I received a rather curt email stating that the managing director who had agreed the terms of my study had left, that her replacement is concerned with confidentiality and is cancelling my access. When I eventually managed to talk to the new manager on the phone (I was told she was too busy for a meeting), she expressed that their practices are unique and they do not wish to share them with the outside world.³⁹ This would come up later in my study too, as I shall explain.

³⁹ Participants at the company in which I was conducting fieldwork at the time when I received this news, tried to help me find another placement, and were happy to recommend me, however I did not hear back from any other offices, and in discussion with my supervisor and the then Director of Graduate Studies, I decided to keep my fieldwork to two sites.

I met with the gatekeepers of the final two companies who were both interested in my study, as my research proposal sparked interest and they were happy to enter into discussions on anthropological discourses and concepts of culture.⁴⁰ Both, I sensed, adopted values highly embedded in the profession - that an important dimension of practice is to teach and mentor, to share insights and thus cultivate the professional milieu (I discuss this further in Chapter 5). Both gatekeepers spoke of their everyday reflexive practices, their own interests and research undertakings, and asked me about my past experiences, particularly master planning in China. I believe that knowing that my background was from within the discipline and that we could speak in a common language helped to create rapport. I suspect that the fact that I am at Oxford in the Programme for the Future of Cities helped in affirming my legitimacy as a student, researcher and professional in my field. I came to discussions having done some research on the companies, which provided a basis for discussion as well. Overall, initial discussions were of a professional and friendly nature. As a friend of mine who works in the milieu advised me, 'You can interest people on an intellectual level. For planners, it will be a fun break from routine. Don't forget, these are *our* people, they are interesting and will be interested in engaging with your questions. They are stimulated by curiosity.'

⁴⁰ Importantly, my contact with both firms came about through mutual contacts. One introduction was made through my supervisor, Steve Rayner, and another through a friend who works as a private developer (another of the five firms I met with was also a contact of Steve's).

Through these discussions, I explained that I must be careful in my descriptions of the research, so as not to influence their behaviour during fieldwork. I reiterated my commitments to the University and the Clarendon Fund, to the research ethics committee, the ethnographic process and to our shared professional values and courtesy. I had outlined these in the initial research proposal, noting an understanding that the professional guidelines detailed by Royal Town Planning Institute (RTPI) and/or Royal Institute of British Architects (RIBA) Codes of Professional Conduct provide a shared understanding upon which to build an agreement. I addressed ethical issues that I thought would reduce risks to their firms in our exchanges:

- By conducting research in several firms, it is possible for me to conceal the office identity as well as those of individuals in the study. I would conceal projects and clients. (How each of these will be represented will be considered during and after fieldwork).
- No documents would be published unless already in the public domain, without previous consent by the firm and the creators. No visuals from the firm will be taken or photographed.
- Entering the firm, I underwent all the basic training and meetings that a new intern or staff member does, including a review of the code of conduct of the office with HR.
- Each company would decide how to present me to external consultants or other stakeholders, and whether to allow me access to them at all. One firm decided to present me as a researcher on their behalf and request oral informed consent that I can participate in the meeting, provided that my work is focused on the behaviour of the firm being studied.
- To obtain informed consent from all participants, an information and informed consent form was provided to the firm's gatekeepers to

distribute, and in the case of interviews, verbal consent would be obtained in advance. If anyone objected to participation, I ensured that this person's practices would not be included in my descriptions (though this did not occur). All personal communication remained confidential.

- I requested two points of contact within every office in case I had any questions, requests, or need to report any misconduct that I come across (according to their workplace guidelines).

The terms of my access began with a consideration of what role I could have within the companies, on the basis of my experience and skills while considering my research commitments. It was agreed that I would come to the office full time for an estimated four months. Within one firm I was asked to be an intern for four days a week and 'left alone' for the fifth day during which I could 'do my thing'. This made sense because the company had a training programme for interns that would introduce me to their practices and eventually would lead to greater participation and understanding on my part. We agreed that I would be granted more access than a regular intern with opportunities to observe various meetings and projects. In the second company, we decided that I would spend most of my time observing and helping out where I could.⁴¹ These discussions and my research proposal informed the early days of access within each company.

⁴¹ The third company who eventually rescinded their offer had defined my role as 'almost an employee', with the flexibility and mobility that I require as a research to be negotiated in the field on a case by case basis.

As time passed in the field, however, both the participants and I recognized that access negotiations were not complete and became a continuous process. Within several weeks of starting research in each site, negotiations ensued towards confidential disclosure agreements (CDAs, also known as non-disclosure agreements or NDAs), involving company legal representatives and a lawyer at the University Research Services. I became the go-between for some of the exchanges, mostly by email, as each side specified responsibilities and constraints. Neither company wanted to make my research impossible, as talks and correspondence took place with a generally open approach. In my past professional roles, I had always signed similar agreements, as all employees are bound by confidentiality to protect the interest of the companies, their proprietary information, their clients and projects.⁴² The difficulty in my case was to imagine how to specify what data I could write about and expose to the outside world, and what needed to remain confidential and anonymous. The aims were to reduce risks to the companies and the clients who put their trust in them, while at the same time, granting me room to manoeuvre in order to write the thesis.

The contracts were eventually finalized, though in both cases, were signed only in the last weeks of my fieldwork in the companies. By this time, personal

⁴² In one of the companies, the legal representative was particularly adamant that I would sign the agreement as an individual, making me liable for any damages incurred, rather than the standard practice that a representative of the University signs. I agreed to this amendment, knowing how much weight is given the professional ethics of individual practitioners across the discipline.

relationships of trust and respect had formed, I suspect making it easier to reach an agreement. However, the absence of a contract between the firms and I through most of my fieldwork meant that, in some ways, access was an ongoing discussion, with varying degrees granted at different times by different participants (Chapman 2001 notes that access negotiations are important to establish the ethnographer's everyday access). In both companies, I did not observe client meetings, although in one I was present in meetings with outside consultants. In the larger of the two companies, some staff members were dubious of my research and refused to grant me access to their projects. They eventually agreed to be interviewed although they both remained guarded in their answers and one refused to be recorded. One told me that his team's work and their competitive advantage are directly related to their practice methods that he would rather not share. The guarantee of anonymity and confidentiality made little difference to these planners' willingness to talk to me.

Though the signing of the CDA helped to soften some of the boundaries, they also emphasized the importance of secrecy across the competitive private sector, and the political and public role of planning practice. Simakova (2013, 45) states, in her ethnographic study of a marketing firm, that '[w]hile NDAs are negotiated routinely in business settings, there is no standard assumption about what such practice may mean for the production of ethnographic analysis'. The complications embedded in this statement remained elusive to me as I proceeded with fieldwork. I became aware of the implications of signing such agreements in the process of writing, as I

will discuss how the CDAs are embedded in the thesis in the final section of this chapter. Prior to that, the following two sections describe research methods in the field.

Participant Observation

Entering the field as a participant observer meant incorporating my experiences and possible biases into the study so as to reflect on them and continuously negotiate my identity as a researcher to assess the integrity of my findings. Traditionally, participant observation is based on a clear distinction between the ethnographer and the subjects being studied, or *natives*: the first travelling a great distance is allegedly the carrier of an objective point of view, invested in learning the local language, engaged in their practices with a view to understanding the native's 'vision of his world' (Malinowski 1961 [1922], 25). The boundary between the anthropological field and home, which has so often been demarcated by the metaphor of travel, has incorporated a presumption that *home* is stationary while the *field* is a journey away (Amit 2003). Hastrup (1993) distinguishes the anthropologist and native by considering their ways of being as two different knowledge projects: the native 'is operating on a practical level, while the anthropologist in the end moves up to a theoretical understanding where the native's point of view and voice are included in the analysis, but are not the equivalent of it' (Amit 2003, 153). For Hastrup therefore, engaging in *native anthropology* is a contradiction in terms.

In a comprehensive discussion on native anthropology, however, Kirin Narayan (1993) discards the separation between native and non-native anthropologists in favour of an exploration of shifting identities in theory and in the field. With modernization and increasing transnational connections, there are not only new kinds of fieldworkers, more or less native, but the variation and range of natives are also different (Amit 2003; Marcus and Fischer 1986). Helena Wulff suggests that the relationship between the anthropologist and the native has become more complex (Wulff 1998, 2000). Her experience as a professional ballet dancer before entering into the ballet field for the purpose of ethnography, meant that her fieldwork constituted a delicate range of shifts in objective/subjective experiences and new forms of nativeness. In projecting an ethnographic lens on the ballet world, an ongoing balance had to be addressed between the identity of a former native with all of the knowledge and experience that entailed, and the recognition of her by the dancers who acknowledged her as someone 'more native than most non-dancers, almost one of them', increasingly so once she became a part of their daily lives. It was not only for Wulff to define herself, but for others to define her. Wulff's previous dance experiences are of other analytic importance to her ethnography. For one, she was able to understand the contexts of some of the dancers' narratives and relationships within the ballet companies. Her grasp of the physicality involved in dancing, as art, personal expression, skill and training, and bodily pain, allowed for the establishment of rapport with the dancers, and further helped in her understanding their day to day practices.

In my fieldwork too, I experienced shifts within a range of nativeness. Much of the study depended on my ability to embed my researcher role in and among the staff as a member of their workplace community and become a trusted colleague in a short space of time. Knowing that I was an architect and planner helped because I often did not need to explain my interest in their work, and most participants quickly accepted that I was like them, only pursuing a doctorate. Some participants had doctorates themselves, or had or were considering doctoral studies, sharing their ideas and concerns with me. Most held Masters degrees. In one company, my technical skills and professional knowledge allowed me to become part of the team for a while, while in the other company, I received training in software and methods that I was previously unfamiliar with. All through fieldwork, I engaged in varying types of participation (Spradley 1980), such as,

- Nonparticipation: Often my role was purely as an observer, particularly in some internal meetings or those with outside consultants.
- Passive participation: I would often be present in the studio but refrain from participating or interacting with other people. I would sit at the desk allocated to me in the open space and become purely an observer, watching and often openly eavesdropping on conversations.
- Moderate participation: I was sometimes asked to conduct certain tasks to help the team, which was also a way for my informants to assist my study. Here I experienced the work methods first hand, engaging with other staff, asking questions and sometimes asking for help. This form of participation helped me to integrate into teams and their everyday activities, to become a temporary native.
- Active participation: When my role in the project was more established, I would sometimes make suggestions and input into the project, albeit in very small often technical ways, to help earn a place among the team. This form

of participation led to inclusion in email exchanges and even the seemingly smallest decision-making discussions. In these cases, I could learn from observation and experience as well (Nelson 1969). On some occasions, when the team stayed late for work and I could find ways to help, I stayed with them. I participated in social events and one professional research visit.

- Complete Participation: I think that despite my being a professional in the same field, I did not reach complete participation, because I was not an employee of the company, was under no obligation to complete tasks (I completed tasks, but was never given ones as challenging as members of staff), and the team knew that I was not being paid. There also seemed to be an awareness of the fact that I was not trying to obtain a position in the company and was outside the natural competitiveness of the work environment. The principals expressed some caution and gratitude when I participated and emphasized that I could always opt out of work if I needed to. I did not face the same expectations as employees and therefore was always somewhat an outsider.

Though my past professional experience granted me access to people's perspectives and in understanding their cultural lexicon, it required additional introspection on my part, to interrogate my assumptions and interpretations. In some ways, I was a stranger: I had never trained or worked in the United Kingdom as a master planner, and my past experiences in Israel and China had been based within other institutional planning contexts and traditions. However much of the everyday practice was familiar, including concepts, tools and methods. It was my responsibility to assume the role of a 'professional stranger' (Agar 1980), to raise my own awareness of otherwise taken-for-granted nuances, and to acknowledge

any difficulties I have in unpacking underlying meanings of terms and rationalities that I am very close to (Brannan, Pearson, and Worthington 2007; Rosen 1991). As organizational ethnographies often demonstrate, researchers are usually closer to their 'natives' than perhaps anthropologists traditionally used to be, and consequently, the fieldworker's strategy must be 'making the familiar strange rather than the strange familiar' (Van Maanen 1995, 20). Ybema and Kamsteeg (2009) propose that organizational ethnography is often conducted within the researcher's own culture, and it is for the ethnographer to develop a distance adequate for reflexivity and defamiliarization of the mundane. Helen Callaway (1992, 30) recognizes that 'ethnographic research involves prolonged interaction with others, yet anthropological discourse conveys the understanding gained in terms of distance, both spatial and temporal'. As Hammersley and Atkinson (1995, 115) state, 'it is in the space created by this distance that the analytic work of the ethnographer gets done'.

Generating this distance required that I create a framework that allows for the range of identities I experienced in the field as described by Narayan (1993) and Wulff (1998, 2000). I draw from research conducted by Nicolini (2009a, 2009b) in his study of the practice of telemedicine, for which he proposes two reverse modes and their respective conceptual tools - zooming out and zooming in. Nicolini describes *zooming out* as allowing the researcher to recognize practice as it is observed in relation to other ideas on practice, to theorize between connections across different practices. He describes *zooming in* as focusing on a certain

theoretical dimension, and for a time acknowledging no other aspects of the study. This process can assist the researcher in considering different qualities of practice - material, discursive, virtual, performative - and in so doing, create distance by changing theoretical lenses towards what may seem to be organized and practicable in the field. To operationalise the notion of *zooming in* and *zooming out* required relinquishing the idea that I would ever experience being either an insider or an outsider. Rather, I sensed that there was a fluid alternation between my two identities, that sometimes overlapped, particularly in negotiating my ethical points of view – on the one hand my commitment to research ethics as established with the research ethics committee at the University of Oxford and to the access agreement I had with each company, while on the other hand, my ethical commitment to the profession of planning and its code of conduct to take planning matters seriously.⁴³

As a technique by which to negotiate my various identities, I used zooming in and out to analyse the practices I observed, exploring categories of thought. Spradley (1979, 93) states that any ‘informant’s cultural knowledge [...] is organized into categories, all of which are systematically related to the entire culture’. The almost natural categories of everyday master planning practices that practitioners often

⁴³ See the website of the Royal Town Planning Institute for an approach to ethics in planning in the United Kingdom (<http://www.rtpi.org.uk/knowledge/policy/topics/ethics/>). The ethical principles outlined by the American Planning Association reflect more closely the ethical conduct I was trained in (<https://www.planning.org/ethics/ethicalprinciples/>). While the language differs, however, there is no ethical discrepancy between the two.

speak and think through – such as project, site, client, deadline, design teams and professional roles – sometimes narrowed my perspective and made me too native to be a proficient participant observer. In those moments, my interest in perceptions of time and space allowed me to refocus my observations, by making zooming in an explicit practice on my part. As discussed in the Introduction to the thesis, time and space are key constructs in planning imaginaries and everyday social practices. I specified key questions concerning perceptions of time and space to establish a continuously reflexive stance concerning the data gathered, and representations generated. Drawing from Rayner's (1982) categories of time and space, I created the following list of questions and used them as a general guide for my observations and note taking in the field:

- Operational Time
 - How is the resource of time divided among staff?
 - How are different values placed on people's time (handling decision fatigue, for instance)?
 - How are benchmarks, deadlines and efficiency defined?
 - How is the client's time referred to?
 - What challenges are there to the patterns of operational time?
- Historical Time
 - What planning projects and best practices are referred to?
 - How is the history of planning associated with?
 - How is the history and future of the site and the city considered?
 - Is time valued, planned and organized within the plan (say, are 24 hours considered)
 - How is a career timeline considered?
 - How is the project timeline considered and translated?
 - How is the 'lifespan' of the project considered?
- Operational Space
 - How is space as a resource divided and valued within the practice?
 - How are different values placed on people's space at work?
 - How is the office organized and what other spaces are integral to everyday practice?
 - How is the office space presented to clients or outside consultants?

What are the qualities of the workspace valued?
How is travel organized and valued?

- Geographic Space
How is the geography of the site considered?
How are the boundaries conceived of and challenged or reinforced?
How is locality studied, interpreted and valued?
How are 'distant' sites perceived, studied and designed?
Does the office perceive itself to have geographic limits?

I also created a sense of distance by reviewing documents of other projects, or of the same project in previous work stages. As planning practice is both highly visual and verbal, documents constitute an integral part of design and service practices. Though in fieldwork I had not yet established my focus on documents as an analytic unit, I often reviewed them as a way of zooming out. Lincoln and Guba (1985) have argued that documents are a way of institutional life, with almost every activity leaving a documentary trail that can be representative of meanings, values and worldviews. It is precisely the idea of a trail that helped me to review practices through the various texts and images they had generated. With access to some of the internal servers of the companies, and with my own email address in each, I came into contact with different types of documents, including:

- Administrative – human resource papers, internal and external emails (professional / social and formal / informal), email exchanges with consultants and clients, and internal project discussions
- Marketing – videos, 3D rendering, photographs, edited technical drawings, published articles, press releases, website development
- Project research and brief analysis – project briefs, maps, feasibility studies, social and historical studies, spatial analysis (graphic 2D or 3D, excel files, photographs, etc), consultant reports, policy documents

- Project development – sketches, conceptual diagrams, 3D physical and digital models, systems diagrams and technical drawings (drafts), computer generated images (CGIs)
- Project presentations – printed or frontal material for clients, consultants and partners, research reports, policy documents
- Books and periodicals for the purpose of reference and study
- Conference proceedings and academic papers
- Personal documents such as time sheets, notes, drawings, curricula vitae

Documents provided a continuous stream of study materials and were often my first encounter with projects as I caught up to their present states. They helped me uncover events that took place before my research had begun, encapsulating long periods of time, many events and settings (Merriam 1998). They were often referred to and were pervasive in everyday practice, though sometimes the absence of documents was more strongly experienced than their presence (as I describe in Chapters 4 and 6).

In this context, I also became highly aware of my own document making practices as a researcher making constant field notes. Everybody in both companies carried their own sketchbooks with them, however, I often stood out as I took notes while participants were simply talking. In the early days of fieldwork in each company I sensed that my note taking was making me different, but as one participant later told me ‘we have just gotten used to you being around, and now I hardly notice how much or when you write’. To maintain participants’ anonymity in my notes, I used letters to represent people’s names (not letters from their names, however)

and noted my impressions in Hebrew to ensure that they could not be read if an informant happens to see them. As much office work was done at the computer, there were times when it was more appropriate for me to take notes digitally. To ensure confidentiality, I set up a secure personal webmail account (Proton mail) within which I typed some notes, ensuring that nothing was kept on the office servers. I have kept all notes on a separate hard disk which is kept locked away and cross-referenced with my notebooks.

While there were days of heightened activity, meetings and discussions, throughout the months of fieldwork many days were spent in a relatively silent office, watching participants' backs as they worked on their computers, and engaging in only brief exchanges. Each practitioner often worked to a tight deadline and I did not want to disturb them. I would spend those days reviewing my notes and office documents, and depending on situations, would bring snacks, or offer to make coffee or tea. Most people either made their own arrangements for lunch or would eat at their desks, although in one company there was a designated eating space for those who brought their lunch with them. Lunch breaks and other pauses were used to engage in casual conversation although in both cases, the open space studio made these rather public and therefore rarely provided alternative insights. The following section discusses how I used ethnographic interviews to engage practitioners in more personal reflective discussion.

Ethnographic Interviews

Malinowski argued that anthropologists should conduct only participant-observational fieldwork, while others, such as Davies (1999, 71), support a strategy more inclusive of other techniques, at the discretion of the researcher, in response to different situations, conceiving of participation as 'a means of facilitating observation'. In the course of my fieldwork, the interview format provided a direct avenue for communication based on the interpersonal rapport built through participant observation. As part of the ethnographic process, I conducted informal and semi-structured interviews. These allowed me to examine and question assumptions I was making, to engage in a genuine exchange of views, and to probe any questions I may have developed in the course of fieldwork. Concerned with implicit meanings of actions and events for the people who experience them, interviews provided an avenue through which to stimulate reflexivity, as I could ask (however subtly) what the respondents' understandings and interpretations were. The semi-structured interview helped me explore 'the perceptions and opinions of respondents regarding complex and sometimes sensitive issues and enable probing for more information and clarification of answers' (Barriball and While 1994, 30). Semi-structured interviews unfolded in a conversational manner offering participants the chance to explore issues either they or I believed to be important from the different viewpoints of both parties.

Overall, I conducted 38 interviews with 36 respondents (I interviewed two twice). The interviews included master planners and support staff in both offices, and two

master planners practising outside of my field site, who are senior in their respective firms, and who I approached through a mutual friend. Interviews provided opportunities to engage on a personal level with respondents as short pauses from day-to-day participant observation in team settings within large open spaces. I made it a point to interview everyone in the studios for a number of reasons. First, interviews were a way to build rapport and respond to any questions or concerns they may have about my research. I often found that following interviews, participants were more likely to instigate casual conversations with me. Second, by including everyone in the study, I made sure that I did not appear to have a hidden strategy, or that I valued one opinion over another. I got a sense that conducting interviews helped to demystify my presence in the office and satisfied whatever curiosity my informants may have had. Once I had interviewed informants, some seemed more relaxed in my presence.

Several informants expressed some nervousness at the thought of being interviewed, however all except one relaxed into the process when they realized that my questions were open, informal, and genuinely about their experiences and insights. Third, I quickly realized that I could not gauge who would become a valued informant in the interview environment *a priori*, and there was simply no way for me to determine how interviews would proceed. I admit that I was often wrong in my initial perceptions and that many of the most thought-provoking interviews were with participants with whom I had had little verbal exchange as a participant observer. Lastly, I also used semi-structured interviews to talk to key informants to

whom I did not have access on a regular basis, such as senior management positions, planners working on projects that I was not observing and other key members of staff in the companies.

I developed a guide that I used for most interviews. The guide was composed of 4 sections. First, I reassured interviewees that everything they said would be anonymous, that I would not use their names or other identifiers if and when I quote them. I asked if I could record (two declined), promised that only I would ever hear the interviews and that no full transcript would ever appear. I asked if they had any questions or concerns and explained briefly that I am researching master planning cultures in practice, and that while I cannot go into detail about my theoretical framework so as not to influence their answers, my approach looks at planning through an anthropological lens – that they are the tribe I am researching.

I began interviews by asking informants to tell me about their personal history, including their professional education, previous experience, and what brought them to where they are today. The purpose of beginning with general questions was twofold: it helped me to understand their background and training, their relationship to their chosen profession, and what experiences and memories had been formative to their practice. I found that many described their current practices in relation to how they differ from or are similar to their past experiences, and how they value them. This enabled me to contextualize their answers later on

by assessing their level of enculturation in their present workplace: how well they know the culture and to what extent they feel a part of it (Spradley 1979). Some were highly seasoned and provided insiders views while others were in the process of learning and adapting to the relatively new setting and could share insights as partial outsiders. Beginning with such open-ended and personal questions helped interviewees to settle into their respondent role, gave them time to adjust to talking about themselves openly and to think in a narrative form. It also created a relaxed atmosphere in which I reassured them that I was genuinely interested in their experiences and thoughts, removing any anxiety that I might try to press them for sensitive information, engage in gossip or other intrusive discussion.

In the third part of the interview, I asked them about the project that they were currently working on and that I was a participant observer in. These questions often started as general questions about how they thought it was going. As they talked and reflected on their practice, I was able to ask more specific questions about how work was organized, how roles in the team emerged, skills required and tools. Depending on their role in the project, I could also ask about their engagement with consultants and clients. In the fourth part of the interview, I asked them to reflect on the significance of doing the project within this particular organization – were the concepts, values, methods or arrangements at all particular to the company and their role in it. Fifth, I asked them how they saw their future in the company and in the profession. Lastly, I asked if there is anything else that they think I should have asked in the interview to gain a better understanding of their

experiences as planners or the culture that they work in. I also asked who they would recommend that I interview next and why. There were three situations in which I strayed from this guide: with interviewees who expressed that they had little time, with those who were wary of being interviewed and I let them lead the discussion more than usual, and in interviews with informants whose roles were highly specialised and the purpose of the interview was more defined.

Multiple times the interviewees expressed surprise at how much they had talked, and some said they had found it therapeutic or personally or professionally valuable to reflect on their practice in this way: indicating that the interview had been a reflective process for them. Spradley (1979, 47) states that '[g]ood informants know their culture so well they no longer think about it'. However, I find this not to be the case within this professional milieu. The reflexive tradition of design professions is ingrained in master planners' thinking, and it became clear that the interviewees had been trained to question appearances and assumptions, to conduct their own research and generally, to take their work very seriously. In the workplace and throughout practice, master planners reflect on their values, ideals, quality of life and social environment. All interviewees were highly articulate and analytical in their answers, even in response to basic questions such as 'how did the meeting go?' In their answers, they would often consider several approaches by which to interpret the question. I did not get the impression that they were trying to assist me by 'offering analytic insights' (ibid, 53), but rather spoke from experience. I did not ask any directly analytic questions or those referring to time

and space as analytic categories, and I asked mostly descriptive questions about processes and experiences, and structural questions concerning organization, promotions and raises, training, reviews, resourcing, etc. On rare occasion did my questions pertain to objects being made, unless the interviewee brought them up. Mostly, I kept within the categories that the planners themselves used - projects, employment, skills, clients, the built environment, work processes, norms and standards, and ethical questions. I sometimes expressed cultural ignorance, having had no experience studying and working in the United Kingdom and being unfamiliar with practices here.

Certain constraints and conditions guided my interview approach. First, all interviews were subject to time constraints and most lasted between forty-five minutes to one hour. I allowed people to choose when and where they wanted their interview to take place, and aside from one, all interviews took place during the workday mostly at lunchtime, except for those with the most senior positions in the companies who scheduled time for me during their work hours. Some interviews were conducted in very noisy cafes and restaurants during the lunch break. The noise and constant distractions meant that I often guided the interview more than when they were conducted in quiet and private environments. Second, I incorporated rhythms of eating into the interview, using the time the interviewees were chewing either to ask longer questions, or to allow them time to reflect on their answer and subsequently offer more information. In general, I tried to use various prompts, such as smiles, nodding, eye contact, engaged posture and verbal

cues to indicate that I was finding their discussion interesting. Another tactic I used was to remain quiet when they stopped talking, to allow them time to reflect and often, after several seconds, they continued to elaborate on their answer. When I sensed that it would be appropriate – when interviews took on a more formal sense with interviewees in very senior positions in particular – I took notes in addition to recording. This was a way to incorporate silent pauses into the interview and keep notes so as to adjust my questions. When I listened to interview recordings and found that twice I had been too vocal, overly sharing from my own experiences, I subsequently decided not to use the remainder of the interview as data, concerned that I had influenced answers.

Writing and Analysis

When I completed my fieldwork, organized my fieldnotes and began to analyse and write up my findings, I realized that my initial idea of studying the companies as units of analysis was impossible. Between access constraints in the field, the confidentiality required by the CDAs, and the ethics of anonymity, I needed to rethink my analytic approach. Although I had read practices forwards, as Ingold (2010b) advised, I found that I was reading my experiences of participant observation backwards, re-reading my field notes re-conceptualise practice. I went through a process of removing identifiers from my notes. I had already hidden names, and now proceeded to remove places, dates, projects, consultants and client identities, detailed spatial descriptions, and company profiles. I was suddenly

left with what I had been looking for to begin with – descriptions of actions, conversations and relationships in the studio.

Reading backwards helped me to see that master planning is an activity constituted by multiple acts of making, of planners attending to making objects as everyday collaborate tasks. Anonymising became a methodological approach embedded in the thesis and its organization. In my writing, I often include lengthy quotes from interviews. I see these as contributing to an honest account of the informants' ideas and words, as they contextualize their thoughts and perceptions. Within the framework of non-disclosure, I use long quotations to offset the abstractions of anonymity: to share a sense of context and relate experiences of everyday practice with the reader. In the chapters that follow, I trace master planning through tasks of making objects, and through the reduced substantive content I highlight the everyday entanglements of practice.

CHAPTER 4: MODEL

This chapter follows the making of a model in the early days of a master planning exercise. The client had acquired a large brownfield site with an area of about 150 hectares - a rare situation to have so much land uninhabited by man, animal, or flora. The site had previously belonged to another developer who had commissioned a master plan from a different consulting design firm, whose framework had been approved by the council. However, the new developer found the scheme unambitious and lacking the vision that such a large and important site required. The client, although based abroad, had a local subsidiary company and appointed a representative who worked with the firm's planners to acquire the site, and once that was finalised, to start work on the design, though no formal contract was signed. Rather, the early conceptual design was seen as a continuation of administrative consulting work, and for the planners, a way to secure the project.

This chapter traces the making of the model, its material attributes informing planning practices. As the team worked through the model, a sequence and rhythm were established relating to the logic of the model workshop, drawings and computer modelling. I trace the model as a physical manifestation of ambiguity, which the planners manage by organising social and material practices, and in so doing, configure the client, their relationship, and their design space. I offer an exploration of how planners reconcile temporal and spatial scales as a mode of ordering collaborative practice.

Starting Soft

‘This project is interesting because it started off with its weakness as its strength, and its strength was that it just wasn’t ordinary,’ explains Oliver over lunch as we reflect back on the month we worked together. A senior planner in his early fifties, he takes me through the initial stages as he saw them, and explains that:

Effectively, the client didn’t have the infrastructure within the company, or the expertise, to actually know what to do with the site. So, it started off as this incredible opportunity to make a city, or a part of a city. So that was an incredible way to start thinking about the site. Rather than starting off as an industry- and standard-led project, here was this incredible opportunity to envision something amazing, and make a city, or part of a city. The message from the client had been that this should be a fantastic environment in every way - for living, working, growing up in - so of course it will all get real and we will have to think through phasing and logistics, and how it all stacks up, but so far we have maintained the quality of the vision so far.

In its early days, Oliver had known the project better than anyone else in the team. He had begun working with the client two months before the rest of the team. He had helped in the purchase of the land and in negotiations with the local authorities, seeing as much of his professional experience had been in the public sector. His work had been part of a soft start, a project stage wherein there is no contract and thus no agreement outlining the way forward. Such early days rely on company financing as an entry strategy to the project, to establish a trusting and committed relationship with the client, and a hand in guiding the project, with the hope of securing a contract further down the line.

Oliver explained the reason behind his early involvement in the project and its time constraints:

Because this site can deliver about 60% of the housing quota for the area, the council need this project to happen. Well, actually, if we don't use their need, someone else will and then that capacity will no longer be available. So there is a moment, where the council need it, and we are looking like the most likely to deliver it, so they are going to support our plan. When things are small, that need isn't as consequential and the council doesn't need the scheme as much, so it's up to you to convince them that your proposal is a good one. But because this is such a strategic site on such a massive scale, you're at the numbers where actually they are depending on it quite a lot. It gives the developer confidence knowing that they are needed, as long as they look like the ones most likely to deliver and deliver quickly.

When the site is so big, the needs of the developers and the council are aligned, but only for a short time; the council needs the development to meet their housing quota while the developers need their support to pass their plan. According to paragraph 47 of the National Planning Policy Framework (NPPF), to boost the supply of housing, local authorities must show that they have a 5-year supply of land for housing development, 'including identifying key sites which are critical to the delivery of the housing strategy over the plan period' (CLG 2012, 12).

Five weeks before our lunch, when the team began work on the project, Oliver and I had not yet met. For the first week of the project, Philip, the project director, and Christopher, Matt and I had calmly been working on initial analytic documents – a map, some diagrams, a conceptual overview of the plan's aims (generic ambitions such as sustainability, walkability, etc.), and a schedule to suggest deadlines and

milestones. While we worked, there was still an atmosphere of fatigue carried over from the previous project in the room, which had been a hub of activity of architects and planners but had slowly been depleted as the project had come to an end, and staff were reassigned to other projects across the company. One-by-one their computers and monitors had been unplugged and relocated elsewhere, leaving most of the long white desks in the room empty. Only two architects remained in the room with Philip, who told them that they would be working on the next master plan with him, and that Oliver and Noah, an experienced urban planner and assigned project leader, would be joining once they completed their current projects. This was somewhat reassuring as both Christopher and Matt were architects with little master planning experience. Until the team was consolidated, I offered to help out and thus became a member myself, fully immersed and active in this initial stage.

Friday morning, only a week into the project, Philip called the three of us in the room to a meeting. We each brought our sketchbooks and pens and sat ready to note our next assignments. He said:

The client will be flying over in one month's time for our first meeting, and I suggest that we somehow get ahead of ourselves to produce scheme propositions. People are impatient and are easily bored of diligent analysis. In the short time we have with the client, I would like us to challenge their team, and to make them go "hey, you've done more than I expected." We only have four meetings a year at which we can have direct dialogue, as the rest will be with their subsidiary company here in the UK. I want us to inspire the client and give them confidence in our capabilities. They see this project as a family legacy and want us to be ambitious. So ... I want

us to make a model, as a real tool for conversation, at 1:2500⁴⁴ scale.

A quick calculation revealed that the model would be well over one metre fifty long, and about one metre wide, depending on where we would set the boundaries. As Philip continued to talk, the other three of us around the table stole hesitant looks at one another. The mind boggled at the work that suddenly loomed for the coming month, and the certainty of late nights in the office. This was an unexpected speeding up of the design process. Reaching in between the pages of his sketchbook, Philip produced a thin piece of trace paper, roughly A4 in size, with a conceptual sketch he had done for the project. I recognized his hand, his style. With his pencil as a pointer, he took us along a path of his ideas as they unfolded across the site: the urban fabric, the suburban to the more rural spaces, the commercial centres, community centres, the neighbourhoods, and all the links between them. Making a model would mean turning the lines on the page into three dimensional objects – but more challenging would be making the leap from the noncommittal strokes of a concept to the material precision of a physical model. Philip explained that the precision necessary for making the model would require a rigorous process, a series of dimensional studies and decision making, out of which the scheme would emerge.

⁴⁴ read as 'one to two thousand five hundred'

Over the next three weeks, the making of the model would be the making of the master plan, its logic informing the means to address the project's ambiguities at this early stage, of which three were predominant:

- The design team were unsure of what to plan. Questions concerning the site's capacity and the type of spaces and buildings required were raised. The design team referred to the local council's framework that outlined a targeted built up area and a master plan previously designed for the site by another company for the previous landowner, however the team uncovered inconsistencies in calculations and scrutinized the old design for its diffuse fabric and lack of place-making qualities. Both the design team and their client knew they had to restart the design process, and when they began the model making process, there was very little to go on by way of sketches, plans, technical or commercial analyses.
- The future relationship with the client was uncertain. The project did not yet have a contractual agreement or financial commitment, nor were expectations in the relationship clarified, such as -who would guide whom, and when and how trust would be formed.
- The internal capabilities of the client were as yet unresolved; the client's local company was not ready to guide such a large-scale project, and it remained unclear how and when the client would be prepared to clarify the concerns mentioned above.

In her study of the making of a 3D digital model of Manchester, Penny Harvey (2009) observed that models are made through a logic of layering that separates data into levels and makes it possible to juxtapose diverse information, both qualitative and quantitative, that when put together provide legibility through a

visual realism. While the layers maintain a dialogue with one another, they also form a vertical material order through which to think through space. She considers the model an assemblage (Latour 2005), calling forth both a wealth of descriptive data and requiring technical accuracy, a device that can ‘credibly aspire to become a valuable mediator in the planning and construction process, stable enough to create some common ground for discussion, flexible enough to reflect and respond to diverse opinion, and credible enough to work for diverse professional and public viewers’ (Harvey 2009, 260). In the following section I explore the layering logics of physical model making in a similar way, as the planners identify, separate and then reassemble the project’s systemic uncertainties in a process of disambiguation. While Harvey contrasts the flexibility and longevity of the 3D digital model with the limitations she attributes to physical models, namely relative inflexibility, unidirectionality, and short-lived relevance over the course of a project,⁴⁵ my approach aims to unpack these assumptions about physical models and to question whether the materiality of physical models should necessarily be regarded as a limitation.

Layering

The team had a week to prepare before a meeting with the model makers in the workshop, during which they programmed their design strategy. At the second

⁴⁵ Harvey clearly states though that she has not studied physical models and that her comparison is based on assumptions.

team meeting, Philip developed a timeline for the delivery of packages of information to the model makers. He organized the information in a seemingly standard system, often used in planning projects: landform (base), roads, buildings and green space. Each of these would constitute separate layers in the shared CAD (Computer Aided Design) drawing to which all team members had access, and which Christopher would oversee. During the design process, multiple layers are often simultaneously adjusted in CAD (for instance, green spaces are designed with building footprints, as one influences the other). But in the design of the physical model, every layer referred to a separate and almost independent material, method and time frame.

The road layer had to be designed first. Philip had seen another model with roads made of a thin sheet of brass and decided to use the same material. The intricate network was to be cut out of a thin sheet of brass, whose lightweight malleability meant that it could be gently bent and moulded to sit on top of the landform.

Adrian oversaw the model making at the workshop and was the team's point of call.

He explained the implications of using brass:

We did consider other materials early on, when he said he wanted metal, and I said, "you've got two weeks and I'm not sure if that's feasible". We suggested, a thin card that has a shiny backing to it, and that's what we've used in the past when we couldn't get metal etching, because you can get it and paint it with metallic spray paint and it looks close. It doesn't have the same finish obviously, but you can get quite a nice finish on it, and we had used it in the past when deadlines were tight. And metal working is not something that we do in-house, so it means sending something out, which is never something we can do on short notice. That needs weeks - to draw it out, to send it out, to make it and have it sent back. There's

a tiny little warehouse up in Scotland, in the middle of nowhere, where the postman passes only once a day, so we have to get the right time of day for them to have done it, get it onto the van, and on its way back down to London. That's why we needed the road file done as quickly as possible, and it was our first priority. In this particular case, I had to ring them up to check that they could actually do it, as it was so big. Because, you see, its acid etched - so basically, they print onto the metal what they want to keep, with black or blue ink, top and bottom, and then they put the sheet into a bath of acid, and it melts away everything that the paint isn't on. So, it etches through completely, and then they take it out, clean it up and send it back. They have a limited size of how big their bath is, and we were pushing the limits. It's rare to have a model this huge. Just the pure time it takes to make something that big.

Tom, a transport engineer with regional knowledge around the site was asked to assess the road network and invited for a meeting to discuss an initial plan for the site. The main question was how much more density on the site could the road network accommodate? How many more cars would the junctions sustain? The council had plans for a train station on the edge of the site, and bus routes running through. The client, it seemed, was reluctant to have major through-roads on the site at all, though it was agreed at the meeting that due to the site's size and strategic location, it would have to provide some major arteries for vehicular circulation.

Between Philip, Tom and Oliver, the decision was to plug into the political process of transport decision making, and to try to provide the council with something better than the existing condition on the ground. The method's aims were threefold:

- to offer a more dispersed network on site in hopes of alleviating some of the pressures of high congestion in the region;
- to advance place-making through transport decisions, rather than making them a purely engineering exercise; and
- any recommendations beyond the site line were to focus strictly on suggestions for optional phases of development in the distant future, rather than changes to existing or planned roads that relate directly to the implementation of this plan.

When the planners asked Tom if they could move the bus stop that was planned for their site, he answered 'Just be conscious that it did take twelve months to do the studies for the agreed routes and position and could seriously delay things. You'd be taking a risk.' Philip answered 'I think that we're conscious that this will be a two-option operation. We will have to consider keeping it where it is.' Oliver finished off the meeting saying 'I don't think we should do anything that will ring bells. We don't want to give them any reason to think that we aren't on their side, or to isolate them from our process.'

Out of concern with the uncertain and possibly unstable relationship with local authorities, the planners and engineers designed the model's roads to seamlessly connect to the existing network. Aware that future changes to the scheme may alter the roads, the team considered their design as a temporary orchestration of the planning process, the foundation for enduring trust. The road layer's material, its raw texture and warm colour, were there to add dimension to the matt, brown wood composite selected for the landscape. Philip had seen a model from another

project using the wood composite for the landform base and was drawn to its tactility and heaviness as a way to capture the developer's attention. A standard and more cost-saving method to create elevation in working models would be to cut out contour layers of cardboard or foam sheets and glue them one on top of the other (Yaneva 2005). However, the wood composite was a material that would be hard wearing and could be reused or its pieces replaced; the longevity of the model during the project lifetime depended on the durability of the land as a base, a platform on which to accommodate future changes. Its observed permanence stood in direct contrast with the material flexibility and mutability of the rest of the model, demonstrating an ability to be responsive to the planning process.

To generate the land mass, the wood composite required a process of milling out the negative space from a solid block. The mill was a CNC machine (Computer Numerical Control), a robot, that had only been at the workshop for a couple of months, and the model makers voiced their concern at successfully programming the mill in one try and, due to the size, there was little time for trial and error. The development of CNC technology began shortly after the Second World War, when numerical control (NC) was designed to provide an accurate method to manufacture and reproduce complex aircraft skins, reducing the frequency of human error by decreasing the physical contact that people had with materials as they were formed. Research and development over the years have introduced smaller, lower-cost CNC machines that have revolutionised the manufacturing industry and workshop capacities. Cutting out curves and complex three

dimensional structures can be as simple and easily replicable as straight lines while automation has increased material consistency (Suh et al. 2008). However, Adrian's description departs somewhat from the idea of reduced error, explaining how his task of model maker is often one of anticipating machine behaviour - 'the computers are telling the machines what to do, and if you don't make the file right, then it can go very wrong, and you have to start all over again'.

As a means of reducing risk, the modellers decided that the base would be outsourced to another workshop with more milling experience. Even there, the model would be too big for the machine to cut from a single block of wood composite, and too heavy to be moveable to the client or planning offices. The land mass would therefore have to be cut like a puzzle, and the question became where to make the cuts. Philip and the team designed the model so that the site would sit in the centre, unbroken, and the context would be pieced together around it, cutting under the main roads to hide the gaps under the metal. To comply with the milling machine's capacity, and the maximum dimensions that it could hold, the site as a single slab would reach 1:2500. The outlines of each of the pieces would be smoothed out to ensure that the curves of all the pieces fit together into a coherent whole. Adrian explained:

We make a lot of models that have to have changes made to them, so they have a removable section, usually where the architectural scheme is, but this one is an odd one, because the scheme section is huge. Also, it is a CNC contoured model, which, if a part would be replaced, would have to be done in the same style, probably by the same company to make sure that it matches.

Christopher was in charge of all the CAD (Computer Aided Design) files for the model workshop, and often coordinated with Adrian by phone, email or going to the workshop himself. A day after he had finished the contour line file for the landform, he told me how it had gone:

Sometimes I am just coordinating at length over details – what kinds of lines they want for different objects. Mostly it runs smoothly. But today I’ve realised that we had a misunderstanding about contour lines. I had wanted to make sure that I gave him the information in the format he needed it, and I always make sure that all my lines are closed⁴⁶. Sometimes he even says he’s grateful. But with the contours, I asked if he needs me to build the contour lines for the positive space, the mass, or the negative space – the material that the machine would carve away. I guess we misunderstood one another, and I thought he asked me for the positive lines, while what the machine needs are the negative ones. So, the next day he had to spend hours redrawing them.

Despite the error, Christopher seemed excited over his work on the contour lines – generally quite laborious work that nobody in the team would want. I asked him about his good mood. He said:

This was such an opportunity. Rather than trying to analyse a lot of different programmes and diagrams, building up the site’s landform has taught us so much about it, as a team. Even Philip, to a certain degree, had not been fully aware of all the changes in topography around the site until I separated the lines into a layer, cleaned up the CAD drawing and colour coded each line by height. For the first time, we could see what the contours were doing. We now know so much more about the site and context, the exact location of

⁴⁶ In CAD, a line is closed when the endpoint and start point meet. Not all lines form closed objects, and Christopher went through the painstaking process of converting lines into the right sort, and then ensuring that they formed closed geometric shapes, in order for the machine to read them as milled forms.

water bodies, woodlands, fields and roads. We sort of had an idea, but nobody had really bothered to study the contours. You look at them and imagine the forms, but unless you study them, you don't really know if a line means you're going up or down (see Figures 4.1 and 4.2).

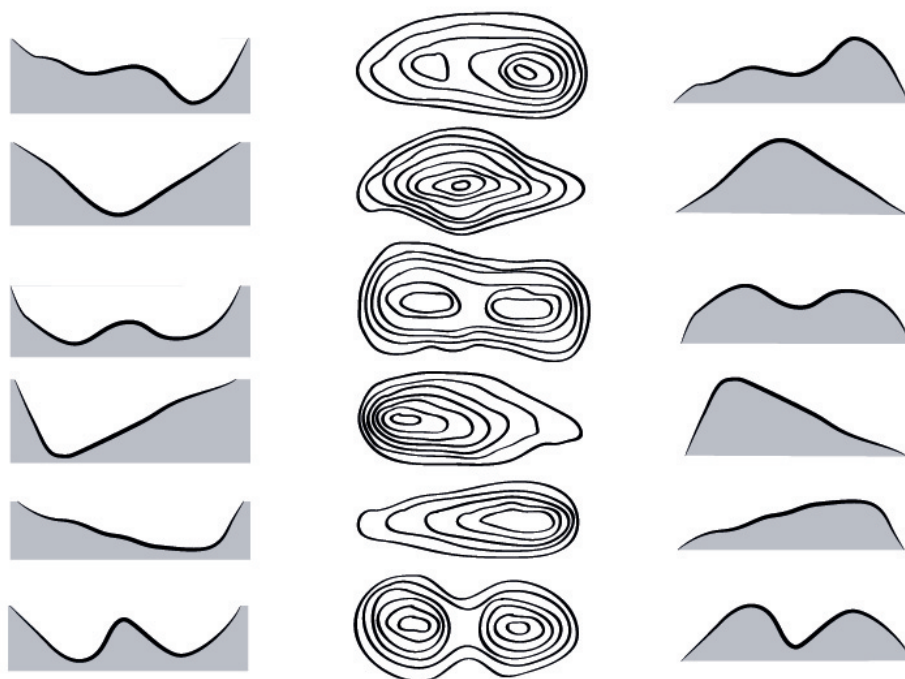


Figure 4.1: Reading topographic maps. As Christopher describes, simply looking at the contour lines, the planner cannot know if they indicate if the topography is 'going up or down'. Source: www.education.com, adapted by author

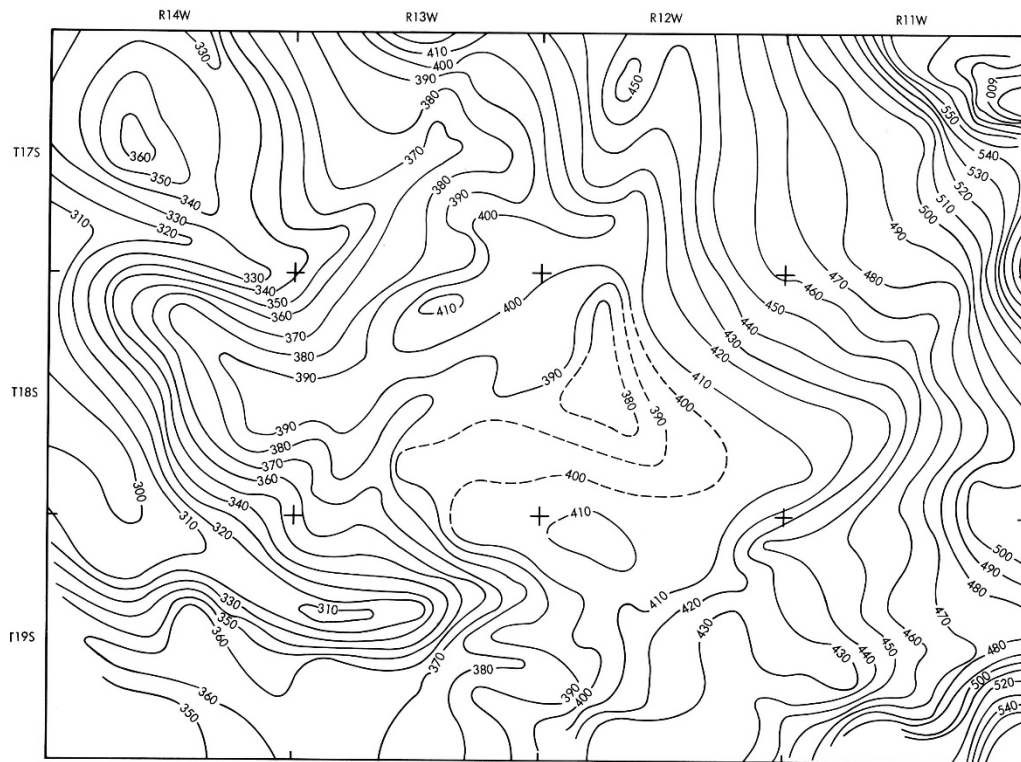


Figure 4.2: Reading topographic maps 2. To understand the landform and prepare the map for 3D printing, Christopher looks at the relationships between the lines and the number representing contour height. Source: <https://socratic.org>

Christopher's remark highlights that the model's landform mass would represent the landscape as it exists, rather than designed. Its form was the starting point of the project, based on the map made during the initial site analysis. On the map, and subsequently the model, topographic lines are lassoed by the red line, the boundary that distinguishes this site from other sites and other spaces. The line frames the planners' commitment to place, and 'unfolds potential [as] it re-makes territory' (Corner 1999, 213)⁴⁷, as a space in which to perform creative planning

⁴⁷ See Dodge, Kitchin and Perkins (2011), Farias (2011), Kitchin and Dodge (2011), Latour (1986), Turnbull (2007a, 2007b) and Wood (1991, 2011) on the performative role of maps in mapping practices.

acts. The view of the site as an object raises questions of interiority – the future of the land, of development, value and spoil – as well as concerns with reconnecting to sites around, with a focus on forming continuity along edge conditions.

For Philip, the building type and dimensions provided the base constraint through which to further partition the site into neighbourhoods, functions and parcellation of ownership. The future of the site as an object is a division into more, smaller objects.⁴⁸ Noah called it architectural urbanism, apparently a term frequently used at the Architectural Association⁴⁹:

We are architects interested in the city. And our clients tend to be developer-led, so they are interested in the yield at the end of the day. And they come to us because we can build buildings, so we actually know what works on a site plan and what doesn't. And in that sense, it is architectural urbanism because it is driven by the buildings, as much as by the transport, the open space, the landscape. Other firms are more socio-economic or specialize in transport. What we do is propose transport solutions that must then be assessed and improved by an engineer. Only then do they become an engineering proposal. So, I think in that sense we are also limited, by focusing on urban morphology - block structures, street widths, heights, building dimensions. But we won't be able to fill all the other layer. But somebody else will be able to do that. It all depends what your starting point is. For some landscape firms, they do master plans based on open space design. Then they would need somebody else to come in and check that their block dimensions work! So, we all need one another, and then it's just a decision of where you start.

⁴⁸ Different forms of spatial maps exist in planning practices, see (Brewer 2008; Te Brömmelstroet, Hoetjes, and Straatemeier 2006; Bugs et al. 2010; Evans, Smith, and Pezdek 1982; Maantay and Ziegler 2006; Pafka 2013) for discussion.

⁴⁹ The Architectural Association is a School of Architecture in London, commonly known as the AA. It is the first oldest independent school of architecture in the UK and is highly esteemed internationally.

From the outset, one of the main sources of uncertainty was the appropriate building density across the site, within the bounds of what the council might deem acceptable and what the developer might consider most profitable. Philip and Oliver were waiting to hear from the developer what his real-estate analyst advised – which residential types would generate the most yield, striking the right balance between building size, types of units and population density. Building densities are measured by floor area ratios, or FAR, the ratio of floor area to land area. FAR does not provide controls for building heights, footprints or coverage (the proportion of land covered by buildings), so it is possible to design low-density high rises with small footprints and low coverage, or other high-density low rises. Another commonly used measure of density is residential units per hectare, often used to estimate future population figures⁵⁰ (Dovey and Pafka 2013).

⁵⁰ Net density refers to the number of dwellings on land devoted solely to residential development, which is adequate for the developer to understand residential zones, however inadequate for the overall understanding of urban or gross density, that includes the street and road network, water bodies, and other undevelopable sites.

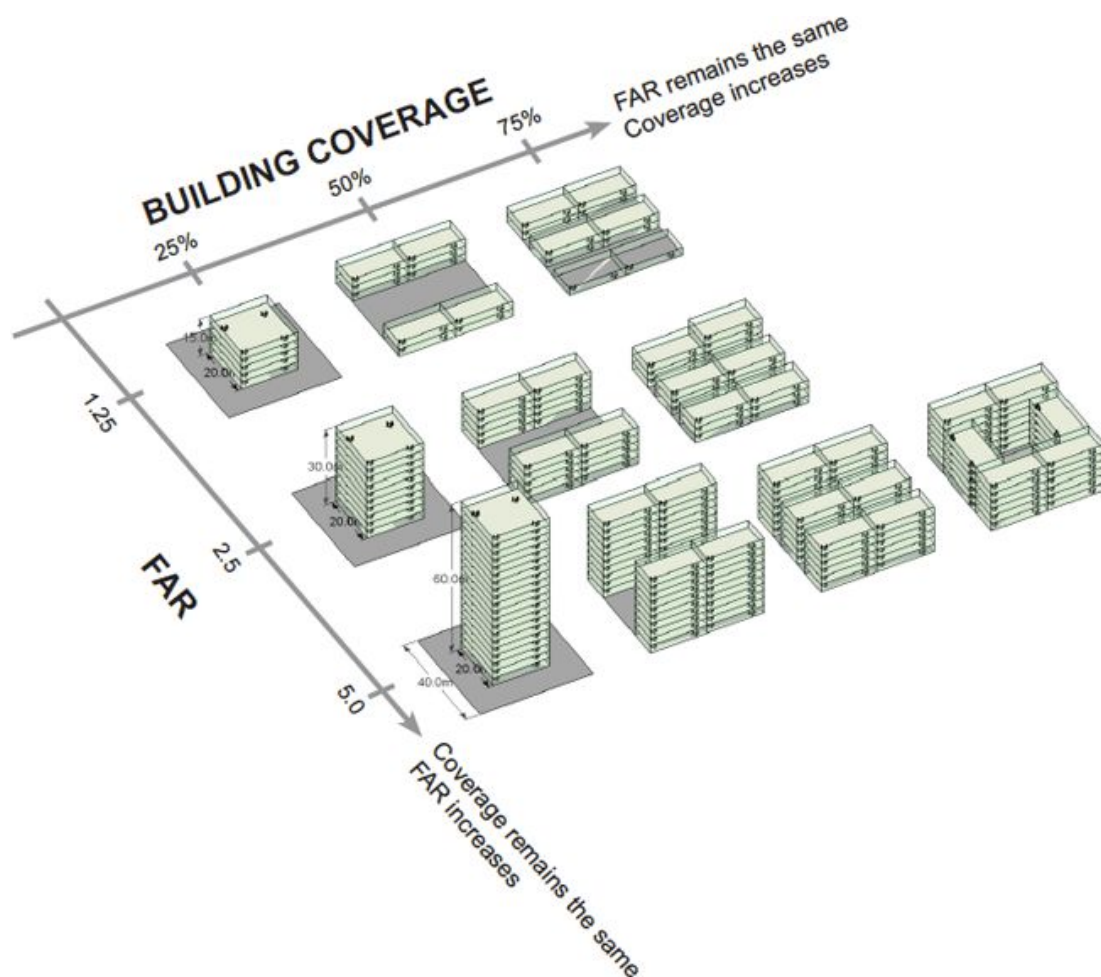


Figure 4.3: Diagram showing the relationship between FAR and coverage density controls
Source: <http://densityatlas.org/measuring/metrics.shtml>

Place-making practices often enlist density controls such as FAR, coverage and open space ratios to design the interrelated aspects such as infrastructure and the experience of the built environment. McFarlane (2016) describes how ‘instinctively, for most urbanists, density is one of the concepts invoked when asked that ever-elusive question: *what makes a city?*’ (ibid., 630, emphasis in the original), and debates on urban density have historically tried to theorize the relationship between urban form and the urban life, including economic and ecological sustainability, creativity and health (Childe 1950; Mumford 1996 [1937]; Pafka

2013). Contemporary ideas on density see it as an important measure in the delivery of urban street life and possible encounters, however there is no definitive formula through which to model the positive effects of density, as opposed to say congestion or over-crowding, and discussions remain highly contested.

Philip's preliminary conceptual sketch had implied a range of densities and building types, from more suburban to urban in quality (Meyer 2013). Initially, Philip saw two possible approaches to the urban fabric's design – one analytical and the second, propositional. The first would have looked back at previous designs and council requirements for the site and its neighbouring areas. However, Philip and Oliver, with the support of an executive partner in the firm, chose to pursue a propositional design, to recommend higher density than previously thought, and thus make the site increasingly urban. Once this decision was made, the question was how far to raise the density. Though uncertain of how the client would react to their design, the planners increased the density to what they considered to be a maximum for the site, in relation to its surroundings and socio-economic functions.

Therefore, designing the buildings and their dimensions was an exercise that Philip called, 'chasing density', to reach the quantities and qualities that he and the team had decided upon. They first partitioned the site by function and, while Philip conceded that the plan was a little too zoned, they decided that it was appropriate for this early stage of the project, as an abstraction, almost diagrammatic, of their

ambitions for the plan. CAD layers for buildings were organized by height to allow the model makers to cut them out of acrylic sheets of different thicknesses using a CNC router. Every thickness of the sheets related to a different building height, though none was exactly to scale. 1 millimetre is the equivalent of 2.5 metres at 1:2500, and the millimetre increments of acrylic thicknesses, couldn't represent floor to ceiling heights (a standard of 3.2m floor to ceiling height for residential and 4.5m for commercial). Christopher and Philip agreed on four different ranges of building heights by which to represent each of the white acrylic boxes of the buildings.

On the subject of buildings, while the model makers were glueing down each of the hundreds of buildings on the model bases of the surrounding landscape, Adrian explained that 'importantly, I haven't stuck anything down on the site landscape. Everything on that is double-sided tape, because any other glue would fix the buildings and we wouldn't be able to change it. So, in theory, the site model can be re-done as long as the landscaping doesn't change.' In consultation with Adrian, Christopher and Philip designed an extra CAD layer whose only purpose was to minimize the use of glue on the site's landform base, to maintain the flexibility of the site model, though not on the model of the land around the site. Thin sheets cut out in the shape of each of the urban blocks were designed to fit under the brass roads, and upon which the buildings would be glued down, maintaining the flexibility and future use of the site base as the design evolved. Philip foresaw

another two or three models of the site to be made in future months on the same base.

Scaling Time and Space

At 1:2500, the model's scale is just between a map and a plan, in other words, any scale smaller than 1:2500 usually refers to a map, the next scale up being twice that 1:1250, is commonly used to identify a development site in its context. Planning application maps, particularly for rural areas where plot sizes are more expansive than urban ones, are often requested at 1:2500. This dates back to 1854, when the County Series mapping of Great Britain (1840s) was required to provide more information than the previous 1:10,560 (or six inches to the mile) scale could show, including land-parcel numbers, land use and acreages per plot. When a development site is as large as this one, 1:2500 is also used in applications (see Figure 4.4 below for an example of the information provided). This cartographic sense of scale, in which the identity of features is preserved through a uniform proportionality, though, tells little of the practices of arriving at this scale or its implicit meanings, which the following sections aim to trace.

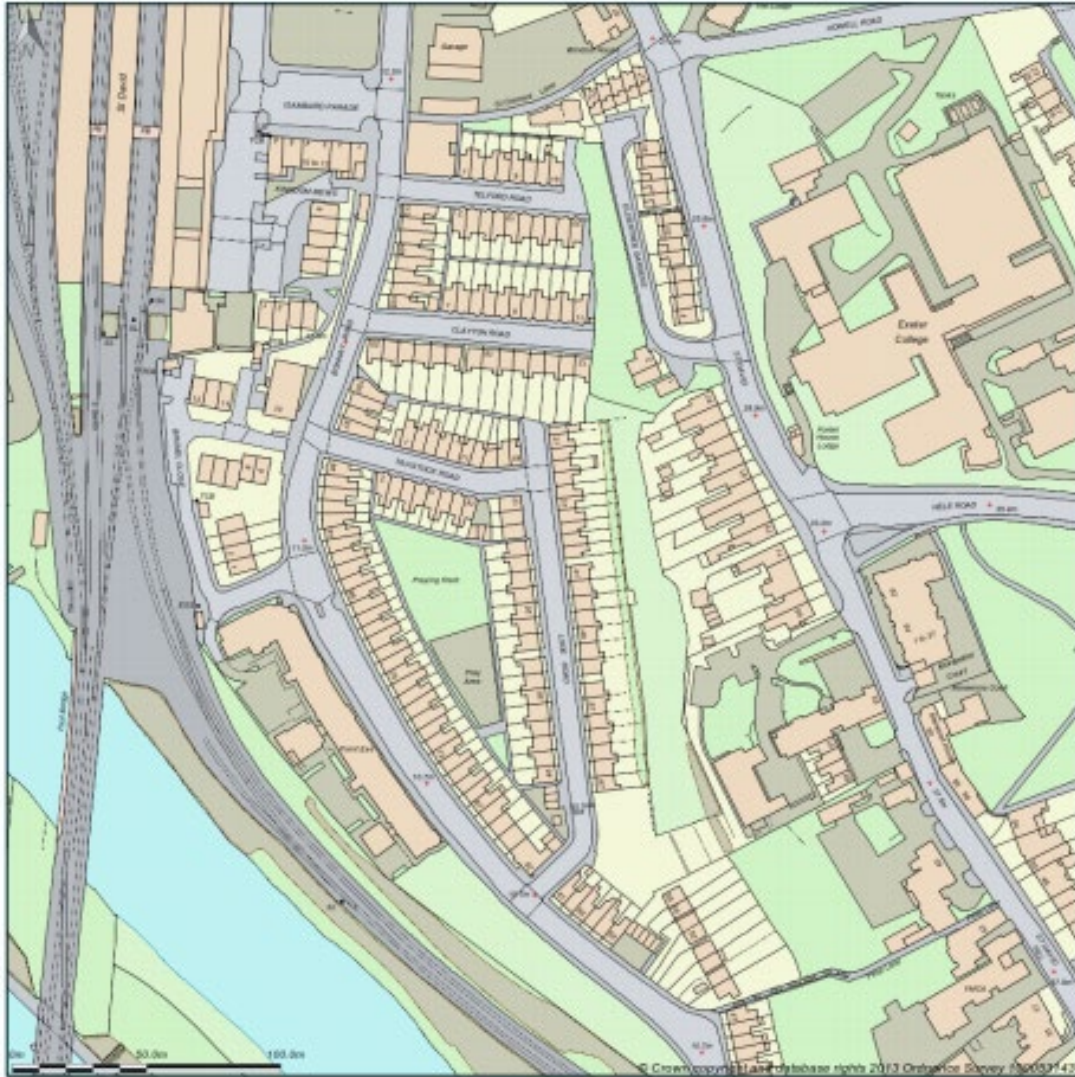


Figure 4.4: Example of a plan drawn to 1 :2500 scale

Source: www.buyaplan.co.uk

The notion of scale as a social construction has a history in critical geography.

Often, theorists reference Henri Lefebvre's argument that space is a social product, a complex social construct based on the social production of values and meaning (Lefebvre 1991 [1974]). Lefebvre's approach constituted a shift from the study of space as given, to space as a diverse range of practices, a triad of perceptions (le perçu), representations (le conçu) and lived experiences (le vécu). A Marxist theorist, he argued that inherent in the production of space, are the spatial

practices and perceptions fundamental to the reproduction of capitalist space, and therefore to capitalist society as a system and political process. Based on Lefebvre's texts, critical geographers have thus developed three central observations (Marston 2000). First is the tenet that scale is not a given fact or measure, but rather 'a way of framing conceptions of reality' (Delaney and Leitner 1997, 95). Leading on from this idea is the second view that scale-making embeds not only rhetorical practices but also material consequences, and lastly, that these are political, contingent and often contested⁵¹ (Marston 2000).

Geographer Richard Howitt (1998) observed that scale is a relational quality. Referencing the musical scale as a metaphor, Howitt considers how musical scales provide a basis from which to expand the more common conceptions of scale as size and level, but as an element that gives salience to relations between complex entities within dynamic geographical totalities, including the environment, space and place. The musical metaphor brings Howitt to consider geographical analysis as having a consistency of elements, such as landscape features, industrial and agricultural sites, ecological processes, etc., but as the scale of analysis changes, so do the relationships that can be perceived between the elements. In other words, while the material phenomenon of the elements remains the same, the different scales provide contextual variety, and the material significance of every element is

⁵¹ For an overview of the evolution of scale as a concept and geographic device see Howitt (2003), Marston (2000) and Sheppard and McMaster (2003).

altered. Here too, the geographic and scalar imaginaries are linked to geopolitical definitions, and Howitt emphasizes the need to become more scale-literate, to study its nuanced practices and repercussions, rather than accept it as a naturalized and neutral measure.

In her study of everyday practices at the Office for Metropolitan Architecture ⁵² (or OMA as it is commonly known), Albena Yaneva (2005) eschews a static notion of scale as a proportional relationship between the world of models and the outside reality, a metric relationship, or a sense of harmony and composition. Her study follows architects as they make, study and analyse and remake working models made of cardboard and foam, revealing how working models are not scaled linearly in order from abstract to concrete, or from little to large, but rather that the scale jumps up and down during a nonlinear design process. Yaneva's focus on temporal rhythms in the design process through which the building emerges, observes the non-sequential practices through which a building's spatial and material qualities become increasingly known (see also Yaneva 2008, 2009). From its earliest conceptions and iterations, Yaneva observes that architects perceive the building as a distant object yet to be defined but already in existence.

⁵² The Office for Metropolitan Architecture is an architectural firm based in Rotterdam, The Netherlands, with offices in New York, Beijing, Hong Kong and Doha. It was co-founded in 1975 by Rem Koolhaas and is known for its creative and inventive approaches to architecture and urbanism. It is among the most influential contemporary firms in the world.

Unlike architecture however, master planning practices generate no discrete object, no single form. In an interview, one master planner described the process:

While architecture has an end product, a building, master plans don't often have one. They are an evolution of so many things. The UK system is a discourse-based planning system, so you enter into a dialogue with a range of stakeholders, and you develop what you normally call a shared vision. It's not your vision, not the architect's vision, and it's not a building. Much of the craft of the master planner is to take stakeholders with you and working collaboratively. It is less about the big ideas or the big strokes of genius, or those things we might expect from an esteemed architect. The master planner, the urbanist, is one that mitigates and brings all the dimensions of city making together to form relationships [...] It is a very rigorous type of practice.

What then, is the significance of making a model, a physical object in master planning practice? In the following discussion, I draw from Carr and Lempert (2016) and their recent book on scale in anthropology, *Scale: Discourse and Dimensions of Social Life*. In it, they consider scaling as a relational practice, demonstrating how acts of scaling do not take dimensional qualities (such as weight or size) for granted, but rather draw distinctions and comparisons between them. Furthermore, they consider how social scales are made to inform categories and orders of relative degrees in a hierarchy of importance in much the same way as maps 'subordinate localities within higher order administrative units' (ibid., 3). Their main interest is in the way that social actors not only rely upon but also produce scales through which they organize, perceive and behave: how the scaling imaginary is not a set of given distinctions or measures, but rather emergent manifestations that rely on 'situated comparisons among events, persons and activities' (Gal 2016, 91 in the same book).

The following two sections examine how scaling practices in model making relate to perceptions of time and space. Drawing from Rayner's (1982) study, I reflect first on operational perceptions as scaling enabled the team to organize socially and collectively direct their attention to ordered tasks. In the second section, I consider the model's role as a boundary object, allowing the planners to configure their future relationship with the client and to scale a shared geographic perception of the site and its future.

Scaling the Everyday

As a project in itself, the model scaled the attention and perspectives of the planners. Initially, Philip was concerned with how to manage the time they had before the client meeting and made the model a measure of that duration. Later in the project, he reflected:

It's a way in which, when you've got a compressed time frame, you need to be sure that you've got an output that will make a big impact. And putting the energy the limited resources into making the model, gives you plans, gives you a three-dimensional quality, it allows you to say things about landscape, and it allows you to say things about context, all in one place. If you try to do all of those in separate drawings, in separate views, there is a risk that each of those elements isn't up to scratch. One of the risks was that it wouldn't be finished. So programming the production of the model was the key thing, and then just work to that. And that helps drive the design and tells you what to focus on next. Having that rigour can take away the panic that sometimes pervades, that is part of the design process. Because you know that those metal etchings are going to have to go [to the model workshop], so we need to design the roads.

Calibrating the scale of their intent, the team managed their time by dividing it into modules of internal deadlines for the following week. Philip and Adrian laid out a 'feeding' schedule of design packages: the roads were due by the end of the day on Wednesday, the building bases or blocks on Thursday morning, the buildings were divided into three separate packages across the site for Thursday at 14:00, then 18:00, with the last one on Monday at 14:00, and the landscape contours on Tuesday. Every day, as Philip would sketch, Christopher would draft, meeting in between to discuss the design that emerged. Time was structured in increments of hours, sometimes even half hours, and any small unexpected change adjusted the schedule for the day. Philip could often be heard saying things such as 'I have just realised, given that our meeting has run over by 20 minutes, and I have other stuff to do, our schedule will have to shift slightly. So 14:00 will move to 15:00 and then 15:00 to 16:00. At 16:45 I'll have to be doing something else.' At the top right corner of every sketch, Philip wrote the exact time he had completed it, thus giving the sketch a name for future reference, and rendering the messy looking pile of trace paper an ordered and coded narrative of the design process to be shared with the other planners.

The team developed a momentum of feeding one another information. My role was to research planning standards and precedent projects, as resources through which to grasp at a sense of size and scale of parts of the site. I supplied Philip with an ongoing stream of information concerning different landscape and building

types, their form, measurements and resulting densities (FARs). During team meetings we would raise ideas of what existing buildings or landscapes we could take as inspiration, and once decided, these distant sites became guides in the process of setting dimensions in Philip's sketched plans, though some were reconsidered or replaced when they were tested as options. While I charted the findings and lay them out on A3 pages ready for the final report, Matt and I coordinated my results with his density studies. He gathered all the buildings' dimensions (including heights) from Christopher's drafted plans, in order to derive overall densities of site sections. Philip had divided the site into zones of different densities by function, building typology, and neighbourhood qualities, and aimed to show the client the possible numbers of units, square meters, and densities that ensued from the plan. This took the plan from a conceptual image to a studied proposition, fixing future discussions on both its quantitative and qualitative values.

Matt also took the footprints of the projects I researched and drew them into the site boundary, to scale. This practice is an adaptation of a prevalent diagrammatic planning technique, overlaying sites to scale to make sense of their dimensions. I recall how in my work as a master planner, projects often began with urban plans of Manhattan, Paris and Barcelona striking images that may refer to the experiences of distance elsewhere. For this project, however, Matt's overlay created a repository of knowledge in the form of reference projects, a visual library of ideal types given a new context through their proximity to each other. For the client, this image would also become a map, as each of the projects was added to a list of places to visit for

study and inspiration. However, the main purpose of the site overlay studies was to mediate scale, removing ambiguity of size and of what the site had the capacity to contain. Later on, I asked Philip what he thought of my interpretation, and he responded:

Mmm, well, you can cherry pick, magpie-like, from the world around you, to say, for this bit we have this in mind, and this bit, we have this in mind, so it fleshes out the gap between the model and its scale. Although it's at a city-scale, this process gives a sense of what that house might be like, and what kind of landscape this is. It enables us to do things well by using different media, and cuts out the middle., or the certainty accomplished during architectural design.

Once finalized for the physical model, Christopher sent each one of the packages of design information to Theo, a planner who had recently left to live in Melbourne but was still engaged by the company. His job was to build a three-dimensional digital model and to send back images to help the designers visualize the plan as it came together, and to send to another firm (based in London) hired to produce the computer generated images for the project (CGIs). Having Theo on the team working in a different time zone ensured continuous work progress over the course of almost 24 hours, helping to meet deadlines, but also made Christopher's job of coordination often a hurried one. Pictures of the digital model were often perspectives taken from quite high up, as if from a helicopter, and as Theo emailed images over to London, Philip's focus increasingly shifted towards the roof plan. Christopher explained how his role became increasingly challenging as perspectives shifted:

Given the tight time frame, it was good to have Theo in Melbourne because he would pick up where we would leave off, and by the time we would come in every morning, we could pick up from where he had left off. He did get quite frustrated though as we continued to edit the scheme as he was working, so he always had to make changes. Then due to time constraints, the CGI team began modelling by themselves, rather than waiting for Theo to make the updates, and that's when I suddenly had to oversee three different models and model makers to ensure that they all contained the same information. There were many phone calls, emails and sketches made to try to capture the changes. Most of them were details caused by late changes, refining the building forms, adding more details and making the model as a whole easier to read, as special buildings were designed to stand out physically from the rest by emphasizing their different functions. Each of the models had to be visually legible. I think that for this first throw of the scheme, many of Philip's decisions have been made with a ground floor perspective, thinking about the street level, how people walk and drive through the site. However suddenly with the CGI we had to adjust to the buildings' context being understood through the roof plan.

While the process of coordination took on a steady, hurried pace, Philip and Oliver were attentive to the rhythms designed into the built-up fabric. As Christopher explained (above), at 1:2500 the sense of spatial and geometric repetition was clearly visible, emphasizing where the emerging patterns were broken with a unique, almost landmark form. As the team continually questioned the fabric they were designing, Philip was discerning of the typological decisions he was making. When he sketched with me present, he often vocalized his thoughts as his pencil moved across the plan:

There is a nice sort of ad-hoc looseness here, but by the time we get over here, there's no reason for it. Though we do have the woodland here, which I suppose creates variation. ... And when you drive here, you pass by these buildings, revealing the rhythm of the development. Depending on the typology used, we are either providing few units with views of the park and direct sunlight, or, if

we do a U shape, we're sharing light and views among more flats. So we are actually transitioning to a more communal and more absorptive typology here. Let's study this typology more in detail and see what it means to put one here.

That would be my cue to return to my research.

The school facilities required by the council were a main concern for the planners to interrogate: would the schools be special or not? The question was in fact for the client. If he intended to build them, then they could be unique architect-designed campuses as part of larger community hubs, around which the planners wanted to regroup some of the open space and recreational quota in the brief to create a park. The schools could provide a hiatus in the residential fabric and form part of a new public space. However, if the council intended to pay for the schools, and the buildings would be typical structures, then the planners didn't want them to be central in and to the plan. This conditional ambiguity, Philip and Oliver contended, would have to be clarified early on in the process, and it was decided that for the model, they would design the schools as they would hope to see them – as centres of social spaces. This question of typical and unique was left for the client to debate and clarify.

The design practices of bringing building and landscape types, project precedents, functions and densities into the site's space, side by side or one on top of the other, entailed the creation of a set of relational measures – connectivity, proximity and

dimensions of co-presence wherein every form became a catalyst for a range of unexpected possibilities to be analysed. With every design decision, the scheme shifted slightly, until, through a process of elimination, the plan emerged as a whole rubric across the site. Scaling the focus of practices thus also scaled the design space, or decision space of the team. There was an immediate and inherent agreement of what was relevant for this design stage because every decision was a measurable unit in relation to the model's space.

Carr and Lempert (2016) emphasize that scaling practices organize spatiotemporal links, relating present time back to the past or projecting it into the future, evoking a scaled sense of time (see also Bauman 2016 in the same book). Indeed, by projecting a durational limit onto the model, Philip and the design team modularized and managed their time, dividing it up in relation to the site's space and function that they attended to as a basis for collaboration and synchronization. Once the core team found their rhythm, other planners and designers could easily join and contribute with their mix of skills and expertise, keeping the team's capabilities responsive to the needs of the model and its presentation. Capturing the different layers of information in one object also meant that Philip could grow the team beyond the soft start's initial resources – calling on Theo, a team of model makers across three workshops, and the CGI team. Breaking up time into small increments was therefore a device with which to scale up the team and expand the spatial reach of the design.

Scaling the Future

In choosing to make a model, Philip shifted the emphasis from analysis and diagnosis to an end product, transposing the beginning with an end. As in John Berger's account of drawings and paintings, 'a "finished" work is an attempt to construct an event in itself' (Berger 1953). Rather than producing the careful almost autobiographical work of early drawings through which the artist passes, or in this case, the planner, the practices of making the model orient the team toward a 'planned edifice' (ibid.,). This is an act of scaling in which the design response to the soft start generated an event, or a mode of encounter with the client.

Returning to Harvey's study of the digital model of Manchester (2009), the significance she attributes both to digital and physical models lies in their deployment as boundary objects, wherein the salient quality of the object is its capacity to negotiate knowledge and understanding across boundaries (Ewenstein and Whyte 2009; Sapsed and Salter 2004; Star and Griesemer 1989). Star and Griesemer's original work referred to all representations, be they abstract or physical. They described boundary objects as those 'which are plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites' (Star and Griesemer 1989, 393). The objects are, in fact, techniques capable of bridging across different social worlds, generating a common and collaborative framework that spans social and professional boundaries through knowledge translation, mediating through

difference toward communication and coordination (Bechky 2003; Star and Griesemer 1989; Yakura 2002).

While the boundary object refers to a single entity whose interpretative flexibility allows it to harbour different meanings for various social groups, Henderson (1999) develops the idea of the conscription device, in which the multiplicity inherent in design work is coordinated through the common goal as a unified process of group interaction, as if enrolling the designers in a collaborative process. Through her ethnographic study of engineering practices, Henderson's interest is drawn towards the process and power of a conscription device, as she describes, 'to participate at all in the engineering design process, actors must engage one another through visual representations of the conscription device', and 'participants focus their communications in reference to the visual device' (ibid., 53). She considers these devices, or rather their embedded procedures – drawings, maquettes, sketches, etc., - to be a subgroup of Latour and Woolgar's (1979) procedures of inscription, in which material entities are processed into informational forms such as images, diagrams, charts, etc., (Callon 1991; Latour 1991).

Enlisting collaborative practice, conscription devices focus and engage designers and are in that way 'receptacles of knowledge created and adjusted through group interaction aimed toward a common goal' (Henderson 1999, 74). By directing the early stage of the project toward the model making, the scale of the project

provided an anchor and orientation for the design team, directing the gaze of the client, engaging and challenging him to make decisions quickly. Here was a way to configure the client, a term adopted by Woolgar to describe a process of 'defining the identity of putative users, and setting constraints upon their likely future actions' (Woolgar 1991, 59), to 'define, enable and constrain' the user (ibid., 61).

Drawing from his ethnographic research on the design development of personal computers, Woolgar explains how assumptions about the user, his needs, capabilities and preferences, were parametrically designed into the machine, subsequently resulting in 'a machine that encourages only specific forms of access and use' (Woolgar 1991, 89). The imaginary of the user in the design process thus delimits the flexibility of new technologies. Chrisman (2001) refers to a design process in which users are configured not only in terms of their capabilities and characteristics, but also as passive recipients of technology, as opposed to active interpreters and decision makers. In the case of this model, however, while the client was seen as a lay actor without local expertise, the purpose of the design was to engage the client sufficiently to make an internal change in the company, thereby becoming a professional with the capacity and knowledge to respond to the designers' hunches, estimates and suggestions with decisions. The model was thus a method through which to disambiguate the project brief, as well as the client-planner relationship.

Mackay et al. (2000, 752) suggest that “designers configure users, but designers in turn, are configured by both users and their own organizations,” and that this is increasingly the case in situations where designer-user relations are formalized by contractual arrangements. The absence of a contract in the case of the model, however, also acted to configure the designers’ process and the lengths to which they went to gain the client’s commitment; the absence of certainty was materially evoked and challenged. Meyer describes how, in material anthropology, absence is made present and has agency, as the immaterial is ‘performed, textured and materialized through relations and processes, and via objects’ (Meyer 2012, 103). Fowles (2010) emphasizes that material studies often observe only objects as they are perceived by actors in situated activities (for instance in Latour 2000), while absence is given agency only when it is acknowledged. He argues that absence does things on its own, stating ‘absences push back and resist. They prompt us into action. And like present things, absences also have their distinctive affordances and material consequences’ (Fowles 2010, 28), challenging researchers and writers to grant absence its presence (Bille, Hastrup, and Sorensen 2010). Fowles provides a clear example of the everyday awareness of absence:

One might say, for instance, that a set of keys jangling about in one’s pocket has its own autonomous steely quality that permits it to have an effect upon the actions of key-users. But consider the keys that have been misplaced and so are present only as an absence. These absent keys also impinge upon us in a strongly sensuous fashion: one registers the absence of keys with distress, gropes about the emptiness in one’s pocket, and, defeated, is left standing in the cold outside one’s apartment. Both the keys and the absence of the keys have material effects on the world. (Fowles 2010, 25)

Philip and his team engaged with the missing contract, the commitment between themselves and the client that was still lacking, and through the particularly tangible medium of the model, attended to this gap. In a sense, the planners managed the absence of certainty, by performing a relationship in which they were the providers of a service. Rather than seeing this as a unidirectional communicative process, the missing contract played an agential role, not only eliciting a direct response to the model as a product and an event, but also configuring the client into a particular interrelationship of client, service, and designer.

Perhaps, borrowing from management and organization studies, this relationship could be termed co-configuration. Victor and Boynton (1998) propose that co-configuration is the most recent iteration of capitalist work (chronologically having evolved through craft, mass production, process enhancement and mass customization). Their focus is on firms that create intelligent products, whose development is continuously configured between the customer and company. They identify medical devices and computer software systems as leading industries in which co-configuration is implemented. Their emphasis is on the system that is generated:

The application of configuration intelligence to the product creates a system of customer, product or service, and company. The complex interactions among all three, as a product or service adapts and responds to the changing needs of the customer, is the underlying, dynamic source of value. [...] With the organization of work under co-configuration, the customer becomes, in a sense, a real partner with the producer (Victor and Boynton 1998, 198-199).

Engestrom, Puonti, and Seppanen (2003) extend this idea of co-configuration to services that proceed along a trajectory of collaboration to form adaptive, or customer-intelligent services. While their study focused on complex social objects – white crime investigations, crop rotation on organic vegetable farms and long-term care of chronically ill patients – their conclusion that the object’s system of relationships is temporally expanded, and that objects in work settings engage the client and company in new forms of sociality (see Knorr-Cetina 1997). They suggest that objects can challenge the organization of work, and rather than stabilizing and closing tasks, form an open-ended process engaging people, things and ways of addressing ambiguities. Compared to finished objects, the open ones expand their reach spatially and temporally into client and company relations.

Similarly, the planners scaled up their response to the uncertainties of the soft start, challenging the client and configuring their future role in a client-service provider relationship. While this move was not without its risks, and the client could have walked away, the planners demonstrated both their capacity to deliver beyond expectations and thus perform a catalytic role in the planning process, and their openness to be configured by the client, as the foundations for an ongoing relationship.

The planners’ decision to demonstrate and organize the absence of certainty in the project was not without risk. The client could have rejected their ideas or their

guidance or misinterpreted their designs. Instead, however, the client adjusted accordingly and returned with answers and decisions. Though not as dense as the designers had shown, the project brief gained in density and speed, as the planners and client made a joint decision to aim for a hybrid planning application - a process by which work proceeds concurrently on an outline planning permission for the site and at the same time, detailed planning permission for a small part of the scheme. The model emerged as a measure by which the client and the planners established the geographic potential of the site, coordinated a future scale of development and adapted the vision of the project.

While some of the planners expected the model to be moved to council or client offices to present the initial scheme, Philip remained wary of the potential of the model to mislead:

We don't want to give the impression that it's done, which it isn't. We've got loads of work to do, despite how done it might appear on the model. And that's actually been a problem internally - we found there is a hangover from having done that work, as so much seems kind of resolved, and yet it all needs to be done again. And trying to explain to the guys on the team, what it is you need to do to now validate it properly, hasn't been straightforward and they haven't quite grasped that yet. Now we have to validate all the decisions, particularly the dimensions of the street, the types of houses and parking.

Now that Philip and the planning team had completed the model and used it to engage the client, they had more information and certainty concerning the aims and goals of the project.

Conclusion: Configuring Futures

By scaling their work towards the model, both the planners' time and the client's attention were configured towards the questions they had about the future.

Demonstrating their ambition, flexibility and responsive capacities, the planners inspired the clients to become more confident in their decisions, ambitious with their plans, increase density and the speed with which they hoped to work. In that way, the making of the model was a mode by which to enter into a communicative and collaborative relationship with the client, securing the project for the team.

The story reveals the model to be a mode of framing the design and decision space of practice, to form a collaborative base – enacting strategies through which to engage with the client, to generate discussion and establish an open working relationship. The planners reconcile temporal and spatial scales to frame a collective task, and socially arrange their attention on particular objectives and deadlines. They ordered their work in attending to the material production of the modelling workshop, and time and budget constraints. The planners rationed the operational time they had into small ordered units to pursue a long-term objective.

The planners' view towards a lasting relationship with the client was embodied in the physical design of the model, as it incorporated material flexibility revealing planners' willingness to start the design process from the beginning. The role of the model emerges as a material manifestation through which to evoke and challenge

the absence of certainty in the project, which the planners manage by organizing social and material practices. The day to day sociomaterial and temporal constraints framed the configuration of tasks, and enabled the planners to piece together, or configure, their future, by enacting a relationship between the planners and their client, the project and the site.

CHAPTER 5: DRAWING

For the artist drawing is discovery [...] each mark you make on the paper is a stepping stone from which you proceed to the next, until you have crossed your subject as though it were a river, have put it behind you. This is quite different from the later process of painting a "finished" canvas or carving a statue. Here you do not pass through your subject, but try to recreate it and house yourself in it. Each brush-mark or chisel-stroke is no longer a stepping stone, but a stone to be fitted into a planned edifice.

John Berger 1953

This chapter follows how practices of making drawings are a way of coming to terms with different forms of uncertainty in the future. I follow a team of planners, most of whom are architects, through the making of a master plan that is already quite developed, in a company specializing in both architectural design and master planning. Drawings emerge as a contingent apparatus by which planners follow and coordinate temporary social, spatial, political and economic relations. In contrast with the pervasive allusion to master plan drawings as finished artefacts (as in Holston 1989; Scott 1998), the study reveals their continued incompleteness in practice. At the same time drawings embody the precarious social arrangement of planning as a discipline.

This chapter focuses less on the physical materiality of drawings and more on their situated performative qualities (Pickering 1995; Suchman 1987; Turnbull 1991). To avoid confusion, I have chosen to call this chapter Drawing rather than Plan, as often a master plan comprises multiple components, and may include texts, maps, diagrams, illustrations and CGIs (computer generated images), plans and sections

(Mandelbaum 1990). For this chapter, I define drawings as drafted plans and cross sections (see Figures 5.1 – 5.3), that reference one another within projects to provide a picture of a coherent spatial and material whole.

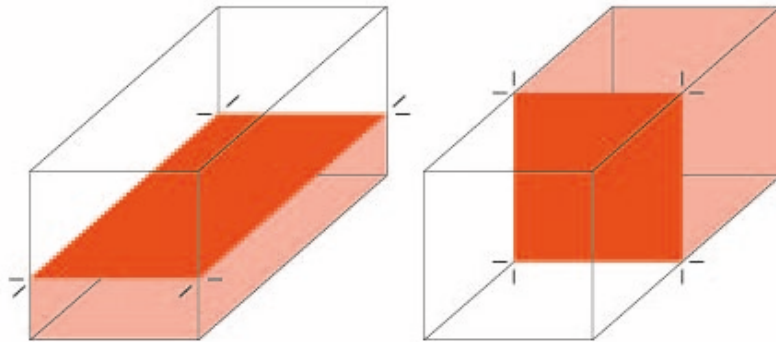


Figure 5.1: Plans (left) cut horizontally, and cross sections (right) cut vertically to reveal a profile. While planning is often associated with plans, the cross sections often help to design and understand the materials, spaces, scale and structure of a project (see Lewis, Tsurumaki and Lewis (2016) on the processes of thinking and designing through an architectural section). Source: Author's drawing

Generating drawings is fundamental to spatial planning and design (Alexander 2002; Neuman 1998). Planners depend upon drawing from their initial project sketches, through different design stages and their outputs. Though planning practice has seen many changes over the last hundred years, issuing drawings – and particularly drafted plans - has been one of the few consistencies of the profession⁵³, and their continuing importance means making drawings is an essential skill (Ryan 2011). Despite their pervasive use in everyday practice, the

⁵³ Some planning ideas since the 1990s have focused on planning as a discursive and communicative practice, exploring the potential of plans to improve communication between different actors (Healey 1992; Khakee 2000).

interpretation of drawings is under-examined in planning theory (*ibid.*).

Anthropological studies, however, provide a rich tradition of exploring the connection between sight, interpretation and forms of practice (Classen 1993, 2010; Edwards and Bhaumik 2008; Fabian 1983; Grasseni 2007; Goodwin 1994; Ingold 2005; Le Breton 2017).

Seeing and Reading

In master planning practice, the importance of drawings is sensed at every moment throughout the studio, as most people are engaged in either making or reading drawings. I observe multiple drawing activities within a project team. Asher and Kelly are at their desks, engrossed in the individual work of digital drafting, often wearing headphones to help maintain their focus on the task at hand. John has a stack of plans on his desk organized by floor level, and as he draws the lines of a cross section in Microstation (a drafting software), he flips through the plans as if going upstairs and downstairs, incorporating the information from the multiple plans into the section. Terry has a plan laid out on his desk, neatly placed next to his keyboard and mouse, as he works through the corrections marked in red on the page, comparing them to a list he has written in his sketchbook and checking them off. Lucy shifts screen views between a three-dimensional model and a drawing manual handbook for graphic standards as she designs, zooming in and out of the model space to ensure that it is both technically precise and of a good overall design, drawing and evaluating her drawings as she goes. William sits at his desk, sketching on trace paper, layering sheet upon sheet that each represent a different

element in the plan. As he draws, he pauses to flip between the different papers to visualize the implications of changing lines in one drawing upon the rest.

Jason, the most experienced planner on the team and design lead (overseeing the entire project), sits at one of the meeting desks with a printed plan and a roll of trace paper. He mumbles to himself as he slowly follows paths across the drawing with his pencil, saying ‘and here we see this, and then we turn in here, and the view opens to this [...]’. Once in a while, Jason pauses his work, and turns the papers around, by as little as 10 or as much as 180 degrees. He later explained:

Truly, it’s about imagination, but a very purposeful imagination. I often turn plans upside down and do them again. This big belief in North goes South and East goes West, and drawing plans that way, well, you often get stuck. Usually, I have a breakthrough when I turn things around. And I just keep thinking, where are people really coming from? Or let’s start with how and what really matters when people leave a place? When you wake up and look out of the window? It’s kind of like trying to imagine through jumps in scale – trying to miniaturize yourself, live inside the concept and then sometimes you think “well, that’s rubbish, let’s get back to my big self and draw it again!” Every time you move one thing it all squidges out somewhere else. So there’s loads of refining. But you have to know what you’re aiming for in order to do that. And if you haven’t had much experience master planning, you just don’t know.

Watching Jason, I see his eyes slowly make their way around the drawings. The lines on the page contour and define imagined material objects, and his eyes follow these edgelines. He has trained his eyes not to see the drawing as an image, but as an imaginary space; he is not looking at a drawing, but rather reading inside it (Tversky 2011, 2014; Tversky et al. 2000). Reading inside drawings enables Jason to

imagine how they enact planning narratives, something I continue to explore in the following vignettes. I describe two meetings that I observed where planners expressed what they saw in drawings to one another, particularly how Jason shared the information he gathers from the drawings using his skilled vision, teaching junior planners more about the specific project and imparting a point of view of planning practice.

Drawing Review 1

A team of planners enters a meeting room carrying large roles of printed paper. They are meeting to review their drawings, to correct them before issuing them to the client as part of a set of deliverables. The team spends fifteen minutes carefully hanging their plans and cross sections on the walls. The drawings are so large that pinning them to the allocated cork boards requires teamwork – two to hold and pin, and one to stand back to see that everything is aligned and straight. Each drawing is printed at a large scale rendering every line visible, and subject to critique. One of the sections has been accidentally printed in the wrong scale, and its author races out of the room to send it to the printers once more. There are so many drawings that they cannot all fit on the walls, so tables are pushed back to allow for the drawings to be placed on the floor.

When all the drawings are laid out, the junior team members pick up their pens and sketchbooks and prepare to note all the comments they are about to receive. Jason

holds a red felt tip pen and begins to examine each of the drawings, standing back at first, then moving in closer to see a specific place, and then stepping back again. As his eyes slowly scan the plans, the room remains silent. Mark, who is project lead, also steps forward and starts to read the plans, using his finger to trace the spaces between the lines, stopping and starting to examine different parts.

Mark: [pointing at one part of a plan]

This area here is looking better than last time. [...]

Jason: [indicating another plan]

What is this line? Why is it different from this other one?

Asher: It's a different kind of parking.

Jason: It's horribly inefficient.

Terry: Perhaps we could change the direction of this ramp if we turned it slightly here?

Jason: That could work. We have to think through these spaces and define what they are. We have to ...

Asher: *Refine?*

Jason: Redoubt. We have to re-doubt our drawings, to know what all of this means, what spaces are made and be able to talk about them. We need a continuous logic through the plans, and at this level of detail, we just need to cover ground and correct them. We also have to reach our target numbers.

Mark and Jason continue to examine the drawings, associating each one with others on the wall and those they remember from other parts of the project they had seen produced by other members of the team. They notice errors in level annotations (floor heights). Squinting, Jason sees that the scale of hatches (patterned fills

indicating spatial volumes or material masses) is not the same across the drawings. He notes further inconsistencies: different sized fonts for labelling, variations in line widths for the same objects, and places where plan levels do not seem to connect. Once the review is complete, Mark and Jason congratulate the team on the progress they have made before leaving. The rest of the team - the more junior planners - stays behind, stepping closer to the drawings to read the comments and discuss the work ahead, as each one is responsible for a different set of drawings.

We roll up the drawings to return to the studio, and as we walk out, Asher tells me that these review meetings accelerate his learning curve, helping him to see the overall picture as Jason sees the project. He explains that the skill is 'to see the process in the drawing, it's not like architecture drawings.' When I ask him to explain, he says 'in architecture, we design buildings as objects, but master planning designs the spaces and relationships between objects.' He gives me an example from projects in the office, however, I will describe his ideas through other drawings to preserve anonymity. Asher explains that because it depicts an object, it is possible to read into the drawing what its' makers ideas and constraints may have been. Figure 5.2 for example, is an architectural drawing showing a cross section of the Ford Foundation building in New York City, from which it may be possible for other architects to surmise that the architect had a vision for an open public space: a large atrium connects the street level with the internal functions of the building, creating a central meeting space that also provides natural light to the offices. It is possible that the site had room for more space than the brief specified, and rather

than designing a low-rise building, the architects had taken advantage of what must have been a generous budget to create a low-density workspace, at once monumental and communal. Asher then points to a master plan drawing (as in Figure 5.3). He points to roads, landmark buildings, the way the buildings relate to the streets and individual plots, etc., and emphasizes that it is difficult to identify spatial concepts, particular motivations and restrictions that guided the master planner. ‘When I see the project through Jason’s eyes,’ he explains, ‘I understand it differently. He can relate the different drawings to one another and sees them as a process rather than a product’.

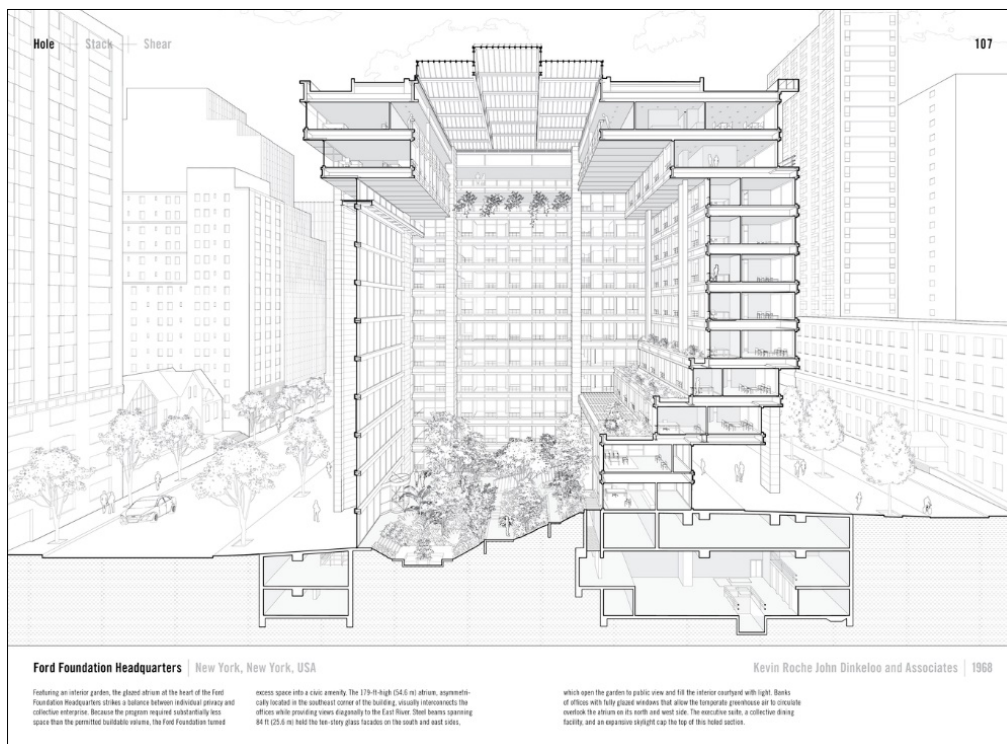


Figure 5.2: Example of a cross section of the Ford Foundation Headquarters in New York City. Architects: Kevin Roche John Dinkeloo and Associates, 1968. Source: Lewis, Tsurumaki and Lewis 2016, 107.

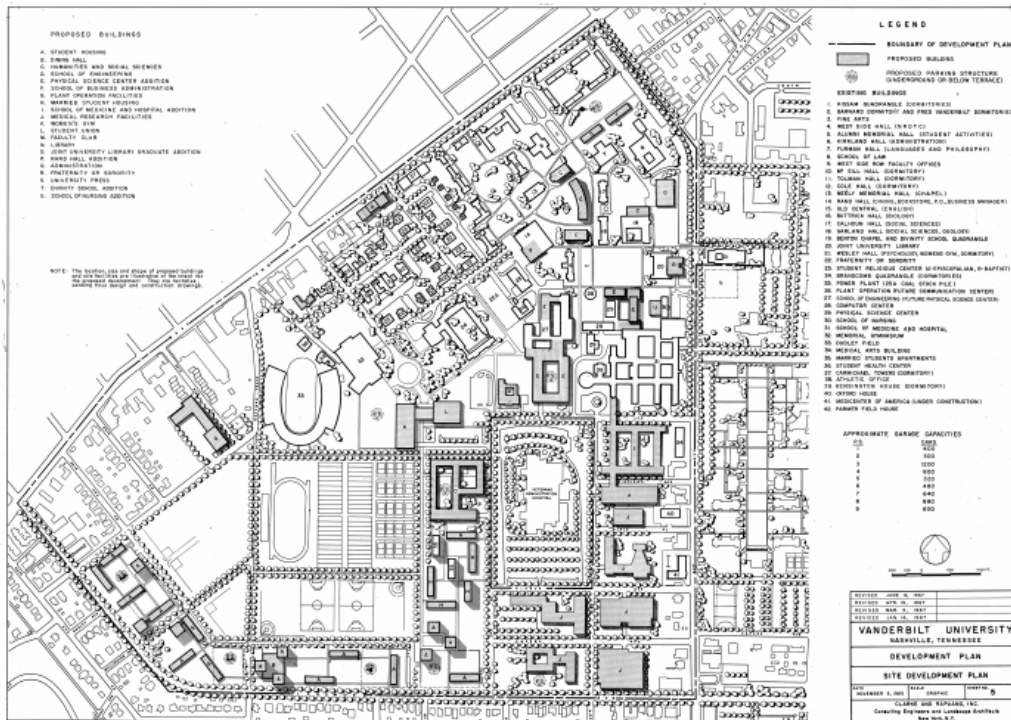


Figure 5.3: Example of a master plan. Development plan of Vanderbilt University Campus, Nashville Tennessee. Engineering and Landscape firm: Clark and Rapuano, 1965, extending architect Edward Durrell Stone's 1940 master plan. Source: <https://www.vanderbilt.edu/futurevu/history.php>

Drawing Review 2

There is a bustle in the office as many in the project team are drafting: making drawings. Terry, who finished correcting a plan, has had his work printed on large A1 sheets and is busy hanging three drawings on the back wall of the studio near my desk. Side by side, are three plans depicting the same site, one in its existing condition, and two in the future, in the year 2025 and 2035, showing the plans at the completion of different construction phases. Once the plans are up, Terry calls Ron and Jason to help him review them. They all stand back, holding red and black felt tip pens, and quietly look at the plans; red is used to mark mistakes, black indicates additions to the drawing.

Jason: In Phase 1, we need to show this existing building, as it will only be demolished in Phase 2. We should also add the new residential buildings to the North that will be up by then.

Why are the shadows so long here? These buildings' shadows are too long, so that small building appears to be a tower compared to the others.

Terry: Here we're missing a shadow ...

Ron: Here the rooftop details are missing.

[to Terry] Could you check – maybe they are hidden under the fill layer?

[They continue to review the shadows and rooftops across all three plans. Once errors have been marked, Jason returns to his desk. Ron and Terry continue to look for mistakes.]

Me: Can I help?

Ron: Definitely! We could do with an extra pair of eyes. It's a bit like playing spot the difference, isn't it? [we laugh]

Terry: In Phases 2 and 3, the place names are written in a different font.

Me: The little footbridge between the buildings has slipped under a landscape layer and looks like a footpath. It doesn't have a shadow either.

Terry: I think there's a difference in how the spaces outside of the site boundary are shown. It is not the same level of detail across all the plans, and in Phase 2 it seems lighter than the others.

We continue to look and spot a few more mistakes. Though I am largely unfamiliar with the project, I can begin to read the evolution between the drawings as my eyes trace around the master plan for each of the phases. Changes to the skyline and on land become clearer. I understand where buildings will be added and taken down, a network of buses will start to run, and bus stations will be built; security guard huts, little pavilions and cafes will be added, and their little footprints tell me that

they need little shadows; the road network will become more complex, and a temporary landscape that brings the spaces together will evolve into a more permanent one with more trees planted and spaces designed.

I am learning that in presenting these plans to the client, the planners need to ensure that the interrelationships in the spaces and times they depict must be coherent and consistent. The planners are not spotting the differences, but imagining the evolution of place, training their eyes to see beyond a single drawing, space and time.

Once we have stood in silence for what feels like a long time, and we acknowledge that we are probably finished looking, Ron takes out his phone to photograph the plans with their new annotations. When he returns to his seat, he lists the mistakes in the drawings in his sketchbook and proceeds to check where else the same errors may have been made. Terry unpins the drawings from the corkboard and gently lays them out on the large table near his desk. He opens the files for each one and starts the process of correcting them.

Discussion

The vignettes show that the planners' skilled vision enables them to see a variety of content in every drawing. As the planners see and read drawings, they attend to three forms of continuity through which they assess their narrative qualities:

graphic, spatial and temporal. First, while Jason assesses the normative potential of the drawings, his attention is often directed toward the rules associated with drafting standards as descriptive and communicative tools. Spatial imaginaries undergo a graphic translation through techniques learned over years of study and experience, learning to use lines and patterns separated across layers of horizontal and vertical information. The aim of drawing is guided by efforts towards legibility, as planners aim to apply a normative set of logics, technics and devices to create and describe the relationships within the urban fabric, its objects and networks.

Much like speaking a language, choosing what and how to draw varies between individual practitioners, often depending on personal educational background and planning experience (Champy 2012; Maynard 2005; Robbins 1994; Ryan 2011). Therefore, across the team of planners, cohesion in drawing style is important. Their emphasis is on achieving a visual logic through the drawings, aimed at creating a single device for representing material, structural and spatial conditions; the descriptive layer of meaning of the plan translates two-dimensional space into three dimensions, distributing functions, people and experiences. The cohesion allows them to read spatial and temporal continuity within and between drawings. As they draw, the continuous logic enables them to capture the planning and design processes as the project evolves, and embodying future time through construction, handover and occupation phases. Every drawing is defined by its relational position to other drawings in accounting for the entire narrative of the project, to enact seamless linearity in the project as the team envisions it. Together, several

drawings represent a relationship between the present and possible futures; embodying a narrative, a set of drawings captures different temporal contexts. The skilled vision of the planner entails reading a plan like a narrative unfolding over time and through space.

As a process of training in reading and making drawings, Jason and Mark demonstrate that for the drawing to perform its planning role, the team must focus their collective attention and analysis towards forming a common language between them and through the drawings they each produce (Ingold 2000). As Kathryn Henderson (1991, 450) proposes, in her study of engineers at work, drawings shape and order design work, bringing people together and generating a creative process towards a shared goal. She writes, '[c]ognition is distributed [...] as various forms of nonverbal knowledge are elicited and captured to some degree through interaction with sketches and drawings'. Henderson adopts the term conscription device⁵⁴ for drawings, as they 'enlist group participation and are receptacles for knowledge created and adjusted through group interaction aimed toward a common goal' (*ibid*, 456; see Henderson 1999).

⁵⁴ Henderson contrasts her idea of conscription devices from Latour and Woolgar's (1979) idea of inscriptions in scientific practices - wherein the visual artefact renders certain aspects of the work more salient and stable (see also Latour 1999).

In her introduction to the edited volume *Skilled Visions: Between Apprenticeship and Standards*, Grasseni (2007, 11) explores the idea that learning to see means to 'inhabit ecologies of vision.'⁵⁵ She considers visual practice to be socially organized within a professional community, wherein 'skilled visions, once acquired, are not so much codes or tools for actively manipulating messages, as much as backgrounds and scenarios that make those messages meaningful.' Across collective planning tasks, visual practice in making and reading drawings is an important element in professional enskilment (Grasseni 2007; Ingold 1993, 2000). In the following section, I explore modes of coordination as the team makes drawings. My observations lead me to examine drawings as complex artefacts in which different experiences of temporal frames are embedded.

(Un)Freezing Drawings

Since yesterday, the project team has been conducting several unexpected meetings and making multiple phone calls. The project engineers had flagged a flood risk on site, and the planners called an emergency meeting as the plan was due to be frozen - suspended at a project milestone - within a week. To freeze the plan constituted achieving a coherent and unified project, documented through multiple lengthy reports (an estimated 2,000 A4 pages including text, drawings, diagrams and CGIs), numerous drawings and any changes at this late stage could

⁵⁵ James Gibson, in his seminal work, *The Ecological Approach to Visual Perception* (1979), developed the concept that people perceive their environment without the mediation of mental processes. He argued that cognition occurs as a direct sensation (see Ingold 2000 for a discussion).

put them in danger of missing their deadline. This project is vast and highly technical, involving several specialized teams of consultants, and the planning team had been working long hours towards freezing the plan.

A team of five planners and three engineers are on a conference call. Up on the screen of the meeting room where the planners sit, the consulting engineers have projected a technical drawing. On the conference table, the planners each has their sketchbook and pen, having laid out large printed plans and sections in front of them. Introductions are made, and the meeting begins.

Jeremy: [project management lead for the planning team] So, what are the drivers for those level changes?

Rick: [a senior engineer] We are protecting our site naturally with the levels, which is good practice. [...] This is exceedance design, and the condition we are worried about is a storm whose probability is about one every 50 years. Essentially, it is the fundamental redundancy needed to keep critical buildings safe, so the water flows away naturally; making the site safe by design, rather than by infrastructure. [...] As the site is near highways, we need to consider how to shed the water off the highways and where the water goes.

Jeremy: So, you are raising everything to prevent overflow from running into our site?

Rick: Yes

Jeremy: What do we say to the client about this oversight?

Rick: Well, I think that these level changes are actually the beginning of Stage 4, of detailed design, and then we will produce a dynamic model of overflow in exceedance events. Perhaps this can wait until the next stage.

- Jeremy: We must consider that there may not be a next stage, and levelling is strategic design. I don't know if the client will accept that this will be updated at a later stage.
- Rick: I don't think it is a huge change on a site of this scale. How much effort is it to do? It can't be too many drawings – we haven't changed any relative levels.
- Jeremy: In plan, it's no problem to change a number, but we would have to rethink and redraw the sections. There would be changes in some graphic materials.
- Mark: Do you only have level drawings for the plan in its final phase? We have to show the impact of the changes across all phases, as the space needs to continue to function without risk. And what does this mean for entrances to existing buildings – are they at risk of flooding?
- Jeremy: There will also be another issue with landscape. If we are raising the levels, what does this mean for the earth depth needed for planting, drainage, and swales? How will these work without risking accessibility?
- Rick: I suppose one option would be to sit on it for now. I question the need to present this to the client at this point.
- Jeremy: I would feel uncomfortable not showing it to them, as they would need to have this information for the next planning stages.

As they talk, David compares the drawing on the screen with one of the plans on the table, carefully writing new numbers to indicate the engineer's changes to the plan's ground levels. Mark scans the proposed level changes, particularly at the entrances to buildings, to see where steps and ramps may be required. The engineers explain the specific changes they propose, moving slowly across the vast ground level of the plan. The planners pull towards them the printed cross sections and recognize that a level change amounting to less than one metre on average across the site, may constitute extensive redrawing and sometimes redesign on

their part, particularly on the lower ground floor. Comparing different construction phases, they also note that temporary landscapes – that may be in use anywhere between one to ten years – will have to be reconfigured to avoid flood risk as well.

This meeting marks a turning point, a sudden shift for the planning team; just as they were ready to freeze the master plan, their workflow is interrupted, and their plan requires redesign. Ron explains that this had happened before:

This master plan has not been a smooth, continuous process. There was a moment at the beginning of the last stage when we thought we had a frozen master plan, and we started stage two, and then one or two months into it, the client found out that the project brief needed to be reduced in cost. And then the client told us that the population projections for the region in 2025 and 2035 had also changed, so our consultants had to go back and redo all the calculations, everything – the sizes of the buildings, of facilities, all changed. Every design, every drawing, had to be revised.

In the days following the meeting, the planners revise their drawings, attempting to capture several work streams and negotiate change between them: they redraw their designs with the new levels to test spatial and material conditions, coordinate with other specialist consultants and discover places where the plan is no longer feasible. As the planners update their drawings, the engineers continue to refine and recalculate their scheme, and the planners, landscape architects, and other consultants subsequently make more changes. The planners note that the project stage becomes inconsistent in the drawings, as parts of the plan are now in schematic design ahead of others in concept design, that must be ‘caught up.’

The engineers continue to question the planners' decision to incorporate changes at this stage, arguing that not every discrepancy needs solving. However, the planners remain steadfast, as delaying a response is regarded as irresponsible. In part, this was the result of the client's decisions because, despite the inevitability of future changes, they asked the planners to create a coherent scheme for every design stage. The client is a public body, and as any consultancy work requires going to tender, the planners cannot assume that they will be invited to perform the next stage of work. Therefore, the planners aim to have a coherent plan at the end of the design stage, and a comprehensive brief for the next stage, which would include overseeing and coordinating different design offices as the different elements in the plan are tendered out to other offices. The planners also express their commitment to the design stage as carrying through the logic of the plan, where information can easily get lost between stages. The responsibility to the design stage is as important as assuming liabilities across the project overall, as every stage enacts a form of realization, supporting those people who may have to continue to work on the scheme later on. Mark described:

I think that it is often the danger that while the market changes, you are asked to change the master plan, and you never get to the point where you get one consistent and coherent system. I think that that's where things can fall apart. Luckily that didn't happen as we had good leadership from our client.

So, we have ended up with certain steps in time rather than a complete fluid system. Which is why we got planning permission as well - we got planning permission for a fixed scheme that has a maximum build-out for the site, and from there, we can always reduce it, but you have a good certainty of planning approval. Eventually this will give individual building designers more certainty and even if the entire master plan won't be built, for some buildings, as long as they stay within the framework, we give our

client good confidence in implementing those. So, we have less uncertainty.

Therefore, the planners test and make their decisions regarding changes in the drawings and refuse to freeze their drawings if they do not perceive them as implementable. The planners rush to complete their new drawings towards the client presentation, generating several key cross sections to explain the new levels. On the day of the meeting when the planners and consultants present their plans to the client, there is a hush in the studio, as the project team wait to hear how their work was received. It is a juncture that indicates the completion of the design stage.

During the meeting, the planners and client agree on a two-month extension period for this design stage, during which they will incorporate the flood risk changes and other developments on the client's side. When they return to the studio, the planners set about assessing how much work they have now, what they need to do and how, setting out a system of prioritization.⁵⁶ For Jason, Ron and Jeremy, the main question is how to incorporate changes - anything re-drawn would require changes across all drawings, whereas a note or diagram in a post-design services

⁵⁶ One planner explained the importance of the work in setting up the extension period: 'There is always the possibility that it will be a different team, so it's important to have a clear definition of what is in this extension of time, and what will be worked out in the next phase. But it is also important to have a clear cut scope, and not get into a point where we end up with a so-called scope creep - and we do further work than we are being paid for. And it is often tempting because changes to scope often make sense in the nature of how the project develops, but for company health and financial aspects, it's important to keep a lid on it.'

report, can stand alone until the next design stage. ‘Saying a *single update* is misleading,’ explained Jason, ‘because what you might think is a refinement has dependencies. If you change the [construction] date of a building, you have to change the date of the infrastructure, and then change the date of the parking. You can’t actually draw that information without throwing it into chaos.’ In other instances, changing the functions or the funding logics of the plan required spatial and temporal changes across the project as well.

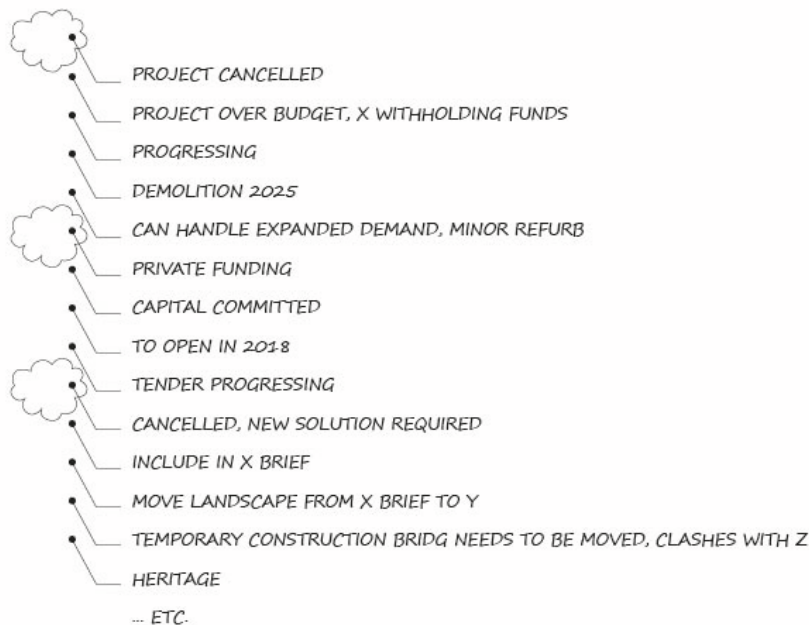


Figure 5.4: Partial list of changes that the team adds to the drawing to indicate ongoing changes

Source: author’s drawing

In the meantime, drawings pinned onto the back wall of the studio during the design stage extension period become covered in red ink, as the planners keep pace with the disordered material world outside. Jeremy and Ron frequently return to the frozen plans on the wall. Reading off lists, they approach the drawings with red

markers once more, this time to indicate changes that are taking place outside the studio – investors, budgets, and programme briefs have continued to change over the last several months, and the planners use drawings to track and capture change (see Figure 5.4). The planners cover the drawing with annotations and revision clouds,⁵⁷ to capture where they will need to make slight and substantial changes to their design. The list visually arranges shifts in whatever sense of certainty the drawings had embodied. The planners decide that during the design stage extension period, they would produce a series of additional drawing studies to interrogate changes and uncertainties and inform one overall instance of change in the next design stage, rather than embark on a continuous tinkering with the many existing drawings.

Discussion

The vignette shows that just as the planning team was ready to reach the end of a design stage, possibly achieving a sense of completion and coherence when the drawings can be frozen, the design process is set in motion again. Freezing a master plan designates suspending drawings temporarily at a milestone in the project, to present and review the project at the end of a design stage and establish a basis for future coordination. The idea of design stages is to provide order and facilitate

⁵⁷ Revision clouds are often used in architecture to draw around areas that have been revised (similar to Track Changes in Word).

coordination between different actors, and freezing drawings provides a sense of order, facilitating a controlled sequence of processes in everyday practice.

Defined by the RIBA (Royal Institute of British Architects), architectural stages outline a standard series of milestones to help coordinate the scope of work, fees and deliverables. However, no institutional framework exists for master planning in Britain, so different actors involved in a project must negotiate the stages of work in master planning. The informality of master planning was enforced in The Town and Country Planning Act of 1968⁵⁸, that reflected the discourse of its era calling for a more adaptive planning approach in the formerly ordered institutionalized plan-making process by rejecting the definition of a series of discrete steps towards a broader flow of practice.⁵⁹

To organize their practices and their relationship with clients, the company had developed their own standard for design stages to guide their work schedules. Depending on how much experience the client has with project managing a master plan project, the company often proposes four design stages of work: 1) assembling information, site analysis, brief development; 2) developing different strategies and approaches to consider options; 3) developing and testing the preferred option; and

⁵⁸ <http://www.legislation.gov.uk/ukpga/1968/72/contents/enacted>

⁵⁹ There is no official master planning requirement in national planning policy (Community guide: Masterplanning 2014, Building and Social Housing Foundation)

4) the production of planning documentation. More stages are added to include overseeing different consultants, integrating changes and managing the implementation of the plan. Depending on the plan, these can become more or less complex. Without more institutional guidance, as one senior planner told me 'that's just our process that we've invented.'

The neatness of the schema of stages is confronted with the reality of continuous change in a project.⁶⁰ Complex realities outside the studio resist closure, and just as the planners had been ready to freeze the drawings, they must unfreeze them to capture change. Master plan drawings are only ever relational, as their world making capacities rely on coordination with other drawings, spaces, times, people, and other drawings - they are variables in perpetual coordination (Hart 1976).

Jason explains:

Other people and other forces will get involved, and that's what is so interesting about cities, that they are not single things designed in a moment in time, but the product of so many people's contributions. I think master plans should evolve almost like cities from the very beginning of the project, and the time it takes can only benefit the plan. You discover the project through the design process, and as a planner, you have to let things go. You cannot get attached because you can only be certain that it will evolve beyond your expectations.

⁶⁰ Design stages often run the risk of scope or schedule slippage, eventually leading to the dreaded scope creep. Slippage occurs when a project is delivered later than the initial schedule baseline had estimated, often occurring when there are unexpected delays. Scope creep is the gradual accumulation of delays, when things are continually added to the scope for a work stage, when the team works at cost.

The vignette shows how different planning practitioners engage through the drawings. Where the engineer sees solutions, the planner reads spatial and material discord, while the developer considers funding implications. As Ellis (1996) explored in his book, *Professional Conflict over Urban Form*, he considers how different subcultures in planning engage in planning projects, and are required to negotiate their diverging, at times contradictory worldviews within design proposals (see also Gross and Rayner 1985). Henderson (1999) describes drawings as they perform the role of ubiquitous boundary objects, enabling multiple readings by different groups. She shows how drawings mitigate different points of view in the design process and thus have the capacity to generate action.

My observations reveal that planners use drawings to enact a temporary compositional whole by which to engage people and resources; the planners made drawings as the basis for negotiation and change. As provisional objects, the drawings embody only an instant where things come together neatly enough to be arranged on the page, incorporating adaptive logics for future rearrangement. Drawings also emerge as temporal boundary objects, mediating between different moments in time through the project life cycle – wherein planners can engage with their past ideas and form new ones – so much so that they often seem perpetually behind in the planning process, as artefacts of yesterday's conditions and ideas.

Across the stages of work, drawings help to contain and define the direction of projects through time. They are used to divide the seeming fluidity of everyday practice into a commodified 'time in events' (Adam 1990; Snyder 2016), wherein changes to the drawings enact a time reckoning of sorts, coordinating actions that define time in a project perhaps more precisely than a calendar could. For Durkheim (2012 [1915], 11), the calendar is an important device for socialization, expressing 'the rhythm of the collective activities while at the same time its function is to assure their regularity'. Project cycles constitute frameworks of social arrangements in the discrete organizational spaces of the various actors, however, within drawings their differences are placed into a common temporal order and design space (Zerubavel 1979, 2003). I propose that as a schema, the progression of chronological time through drawings mediates the rhythms and project lifespans as they manifest difference across the organizations of various stakeholders, creating a single time reckoning through which different actors communicate (Glennie and Thrift 1996; Thompson 1967). Though the engineers and planners continued to disagree over the level of detail a design stage should constitute and what should matter in the present stage of the drawings, eventually the planners tested and redrew a form of implementable reality, and thus established the present reality of the project.

In their ideal, drawings enact the scope of work of design stages. However master planning drawings do not simply freeze. Their temporal reality extends in-between fixed units, embedding the present within a complex narrative of planning

processes resisting the bounded definition of ordered stages. As Jason stated, unfreezing and reworking the drawings to the engineers' specifications brought parts of the drawings into a more advanced stage than others. The space of the drawing created an interface between different design stages, locating them in a common design space, and capturing them in the planning process's present condition. In his study of plans in Kuala Lumpur, Baxstrom (2013, 151) argues that the plan functions as a vehicle for action in the present that does not, in a formal sense, require a singular vision of the future in order to succeed on its own terms. Studying one national plan and another transport plan for the city, specific to a particular urban development initiative, Baxstrom's analysis reveals that the primary effectiveness of the plan largely relates to its status as a virtual object in the present. He states that 'the creation and use of plans as a vehicle of action in the present remains an effective mode by which to domesticate, at least in part, this seemingly uncontrolled and uncontrollable present.' Though his work focuses on institutional planning, the same can be said of the drawings in master planning practice. The drawing is a device that in foregrounding shared future spaces, negotiates them in an ongoing complex present. In this way, drawings bring order to the loose social time of master planning stages, revealing an incomplete and adaptive process.

The idea that drawings are not fixed runs contrary to the view of historic master plans as blueprints, representing and projecting forms and values onto the future (Bullivant 2012). For example, Peattie (1991) explored how planners envisaged the

city as the product of skilful technique and political will, as drawings – particularly the plan – are read as a symbolic system through which to distil hegemonic ideals by manipulating space and other resources. Holston's (1989, 7-8) 'urban ethnography of planning' or 'critical ethnography of modernism' highlights the chasms between planners' utopian drawings of Brasilia, the realities of construction and the uneven experiences of life in the city. Through ethnographic and historical studies, Holston unpacks different dimensions of representation in master plan drawings. He shows that modernist planners imagined their drawings as representations of social and spatial change. Between drawings and the realities of materialization, the urban environment becomes a discursive territory that crosses scales in the planners' imaginary: from street design, to block layout, zoning distinctions, urban social order, and a model for future development. My findings showed that in everyday practice however, the precarious nature of drawings eludes a purely representational role in planning processes.

Sociologist of science David Turnbull has warned against a purely representationalist view of plans. Rather, he advocates a performative approach, 'seeing forms and technologies of visualization as embodied performances and practices, situated and distributed in time and place' (Turnbull 2007, 126; see Nash 2000 on performativity in practice in cultural geography). He studies the examples of the London Underground map and Chartres Cathedral, previously held up as classic exemplars of unified, homogeneous style and design (Forty 1986; Turnbull 1991, 1993). Taking apart historic and visual assumptions, Turnbull shows how both

generate the impression of unity; the Underground map is designed explicitly to mask complexity and divide in London, while Chartres Cathedral evolved while under construction as a 'complex adaptive system' (Turnbull 2007, 135), continuously adjusting to changes in socioeconomic and knowledge systems. Turnbull does not deny the representational dimension of plans entirely but emphasizes the importance of relating representation and performativity to each other, to analyse and challenge their differences – the former implies unity, while the latter emphasizes multiplicity and contingency.

Turnbull's approach suggests that plans and other drawings are devices used and embedded in a range of complex design practices. Picking up on Turnbull's argument, I suggest that master planners, clients and consultants rely on the seemingly representative role of the drawing to investigate the image of the project as a cohesive material whole. However, drawings can only extend representational authority for brief moments and inevitably enter into a performative role when they are challenged and adapted to new conditions. The performative nature of drawings as design spaces reconciles the emerging present with the project as it exists outside the studio – its social, economic, political and material qualities in other spaces – and beyond the boundaries of one instant, spreading the present between the past and future (Gell 1992; Miyazaki 2006; Munn 1992).

In this sense, the drawing embodies the narrative of possible spatial transformations and temporal reckoning and coordination (Abram and Weszkalnys 2011; Yakura 2002). It enacts the uncertainty of everyday life and embodies future contingencies within the operational space and time of everyday practice. The planners use drawings to track changes taking place on the ground and enfold them into their plan. Planners also use drawings to track changes in their vision for the future and engage them in shaping their present work. At the same time, the planners mitigate uncertainties concerning who will be using the drawings next by focusing on the possible changeover. When Jason and Mark read drawings, what matters to them is how others – other stakeholders and future planners - will read their drawings. Their concern is whether their drawings uphold an achievable outcome, represent possible spaces in conceivable time frames, and enact a continuous narrative for the site and ensure a seamless transition to the next stage.

The importance of continuity is not only relevant for the changeover in the coming design stage, but for the multiple as yet unforeseen interactions that a master plan incorporates. Should the plan go ahead towards realization, more and more stakeholders – developers, architects, engineers, designers, community organizations, service providers, etc., - will enter into the drawing's design space. Jason and the team employ two modes of evaluation when they read into their drawings. First, they consider whether drawings can provide an adaptable but organized spatial and temporal framework. As a senior planner explained in an interview, the drawing must find a way to 'mimic how cities grow, mixing order and

diversity: more order than a random aggregate of architectural objects; more diversity than an artefact crafted by a single hand'.⁶¹ At the same time, planners assess their drawings to ensure that they uphold their place-making vision and values.

Abstract or Real Futures

The highly contingent nature of master plan drawings renders them distinctive among design documents because often they do not lead to an end product. Engineering drawings, for example, assemble and articulate information for a future assembly line, culminating in the materialization of a final design, wherein real objects are converted into designs on paper and are subsequently 'used to turn paper back into things' (Henderson 1991, 455). Architectural drawings imply a similar process, tending towards a final object, that translates the design brief, data and client needs onto paper, leading to the construction of an object (Robbins 1994). The control invoked in architectural drawings is not merely scaled up to a greater spatial and temporal intervention in a master plan drawing.⁶²

⁶¹ Modernist master plans were drawn as blueprints, far closer to Henderson's description of engineering drawings; urban life was studied and converted into standard common functions, designed and drawn onto paper and subsequently incorporated into the built environment as a direct implementation (Holston 1989).

⁶² The concern with power in planning studies has been the at the centre of a vibrant reflexive discourse (see for example Fainstein and Fainstein 1979; Flyvbjerg 1998; Flyvbjerg and Richardson 2002; Harvey 1978; Healey 1992, 1997; Huxley and Yiftachel 2000). For a review and argument in support of the performative analysis of power in planning, see Metzger, Soneryd and Hallstrom (2017).

Master plan drawings rarely fully materialize as planners envision, and once plans are implemented – to whatever extent - social and economic forces on the ground lead places to evolve beyond the planner's imagination. Jason describes this:

You have to recognise that bits of it may never happen or may happen in quite different ways from the ways in which you originally envisage, so we have to think very flexibly about that. [...] There is also a certain humility you need when dealing with public larger areas in the scope for variety, there is a need for diversity, and you need a loose enough approach for that to happen.

The purview of master planning is to find ways of defining a range of malleability in the drawing. Planners achieve this, in part, by representing a set of visual guidelines and tools to outline how future designs – buildings, landscape and infrastructure – may interact (Delaney 2010; Maynard 2005; Moroni and Lorini 2016). One of the devices they use is written design codes that provide a scope for interpretation, replacing entirely prescriptive zoning or land-use planning drawings and strict design languages. Codes provide the common language for the urban fabric, and aside from distinct landmarks or other breaks in the fabric, guide the character and feel of a place. In contemporary planning practice, codes have become 'part of the hidden language of place-making' (Marshall 2012, 1).

In the studio, spread across the team's desks are sets of thick A4 bounded documents. With the support of multiple consultants in different engineering and design capacities, the planning team have written extensive codes to guide the materialization of the master plan. Though the codes were written before I joined

the planning team, I observed how the planners continuously refer to them as they change and update their drawings. They check whether the relationship between the spaces that the codes and the drawings describe remains consistent. One planner explained that just how prescriptive urban codes are is at the discretion of the master planner (see Carmona and Giordano 2012 for an overview of design codes in England).⁶³ He noted:

Our focus is more on the performance rather than the styling of future buildings. So, we would provide information and a base case from which architects can explore how to achieve a level of energy efficiency in their design. It leaves quite a lot of flexibility.

Drawings are relational artefacts that do not contain information on their own. To understand what type of control the drawing enacts requires familiarity with other documents that detail design codes. Learning to code master plans entails reimagining the meaning of drawn lines, which are not read as purely imposing and do not necessarily represent a projected material future, but serve as guides that allow for future discussion and evolution. Sam, a senior planner working in another practice explains:

I think that in Continental Europe, you cannot move a building line from a master plan. While in this country, it's guidance, it's not a rule. There is a lot of flexibility in urban plans. There are limits of deviations and other codes that allow you to pick up an urban plan and play with it a little bit. There will be rules that you can't change, like primary roads, movement corridors, or open spaces that are part of the larger spatial strategy, but there are many

⁶³ Though it is beyond the scope to examine codes more closely, particularly as I did not observe them being made, urban codes are increasingly being researched in contemporary planning literature. For discussion, see (Alfasi 2017; Carmona et al. 2006; Moroni 2015).

things that you can change. That flexibility in the urban plan is the foundation of master planning practice in the British system, creating a plan that is able to respond to unpredictable change, such as economic downturns or climate change issues that may arise in the future that we are not aware of now. An urban plan normally needs 25 to 30 years to deliver, so that flexibility is important.

Sam's description reveals how the adaptability of drawings is inherent to the idea of master planning in Britain. In everyday practice, planners mediate between creating order towards a vision of the future within their drawings and incorporating flexibility. Jason sees the adaptability of plans and therefore their uncertain futures as essential for their use as a device with which to navigate through complex planning processes:

I appreciate that we are working more on the DNA of the city, less about creating objects and more about urban fabric. Buildings come and go and are either relatively timeless or relatively fickle and need to be refitted, but fabric is the more enduring feature of a place. [...] Often, it's about *not* doing things as well as doing things; avoiding pitfalls as much as achieving things directly. We try to help clients avoid wrong turns within the design stage but also in terms of second-guessing and anticipating the way in which things are delivered. The more experience you have, the more you can help head off problems, and identify where the vulnerabilities are in making successful places. We negotiate and aim to achieve consensus with people out there in the world. There's definitely a world in here, and a world out there, and some people don't go out there, they only do the in here bit. I love the 'out there' bit. But you've got to have both to keep your sanity!

For Jason, the messy realpolitik that planners engage with makes drawings matter through the entire design process, attending to multiple simultaneous temporal frames. The uncertain future of the drawing is part of the ethos of master planning,

and the engagement of the project with reality is what makes the process interesting and very real. While designing for a possible future, Jason's focus is very much on the present, and on the complex weaving together of multiple contingent conditions. In a way, the drawing embodies a 'temporal thickness' of sorts, a term Nielsen (2014, 168) uses to describe artefacts that belong to an 'extended temporal field', relating the past, present and possible future in a collective copresence, where the future 'wedges itself into the present moment' (ibid, 170). Nielsen draws from Gell's (1998) description of Maori meeting houses exploring how an artefact can enact nonlinear temporal entanglements. Gell explains how the Maori did not experience these buildings as merely a condition of their present time of construction, but rather as temporal fields, or *durées* (Bergson 1913; 1965; Whitehead 1978; Deleuze 1988; 1994), reaching from the distant past and projecting 'towards an unrealized and perhaps unrealizable futurity' (Gell 1998: 258). The meeting houses are designed to embody an ancestral legacy of wealth and power, to demonstrate contemporary skill, and enact anticipated political triumphs in the future over their opponents, thus creating direct and simultaneous relationships between future imaginaries, the distant past and a tangible present.

Similarly, the project drawings in situated practice are exploratory devices embodying possible futures that take on causal roles in the present. They embody a material future in the present, and at the same time, provide an instrument through which the planners can stage, capture and guide present changes as they influence future visions. Having had the experience of completing several master plans in the

past, Jason had developed his skills for envisioning present uncertainties retrospectively from possible positions in the future. Having seen master plans implemented in the past, allows him to keep the future close, maintaining adaptability as a salient dimension through all possible durational manifestations of the plan (Bergson 1913; 1965; Deleuze 1988; 1994; Whitehead 1978). For Jason, the present and future maintain a direct and proximal relationship in the drawings, bringing clarity and meaning to his everyday practices.

For others in the project team, however, the distance between present and future seems impossible to mitigate. The more junior planners, particularly architects, find that the material uncertainty of the drawings can be unsettling. In contrast with Jason's understandings, they perceive the future as remote and almost amorphous as the drawing's representations may never leave the page (Hoch 2007; 2012; 2016; Vike 2013). One mid-career architect working on the master plan explained:

You have a product in the end, but it may just be on paper, or if it does get built, it may not look at all like your designs. I prefer to see things through, and you hardly ever see master plans built, your work doesn't lead to an end product. One of the great pleasures in architecture is to design something, construct it, and then see it evolve and walk past it every day, so you have a kind of certainty because you can learn from your own design. With master plans, I find that it misses the level of checking. You cannot necessarily test it, or learn lessons about planning cities, apart from thoughts about the process itself. It's almost too theoretical, and I'm too practical.

There is a tension in the divide across the team, as Jason later explains, that 'practitioners all vary radically about how much they want to be making things

versus planning things'. Within the single phenomenon of drawings are two modes of thought that relate to making and planning, illuminating the very difference between them through their distinct, almost mutually exclusive sociomaterial practices. Some team members want the material and temporal certainty of making that manifests when concrete is poured into the land, while others are interested in the contingent weaving of urban futures.

The seeming shortcoming of master planning practice, particularly for architects, can be its inability to generate blueprints that lead to construction and completion. In this company, most of the staff are architects including those who do not design but support the delivery of projects in other capacities (legal, marketing, etc.,). Arrangements of career trajectories are very adaptable and diverse, while at the same time, the organization promotes the qualification and registration of their staff as architects. Emphasis is given to the institutional recognition of professionalization. Within the project team, I observed how junior architects took time to participate in an internal teaching and mentorship programme⁶⁴ that supported their preparation for qualification. Support staff and principals in the company attend to individual's careers through the projects they work on, ensuring that they complete the steps outlined by the RIBA to eventually be recognized by the Architects Registration Board. One of the necessary steps includes first-hand experience overseeing construction sites. However, master planning projects often

⁶⁴ See Cuff (1992) on the tradition of mentoring in architectural practice

cannot provide architects with this experience. As many of the members of staff told me in their interviews, master plans are not 'accepted case studies for qualification'. Theo explained:

I think it's a shame that architects are steered away from master planning because they can't qualify if they only master plan. People coming into our team basically don't want to be there because they aren't getting any credit in all the stages that they need to go through to get qualified. It's just so wrong because master planning is so important – certainly no less important than buildings. Then sometimes you get a person who doesn't care about qualifying and who is just interested in what they are interested in. And they are the holy grail those people, because they want to do it, they are passionate and motivated by that level and that scale of work. But they are few and far between. Most architects just want to design buildings. I think it comes around full circle. Once you are fully qualified, and you become established, then I think it's the natural place to go if you're creative and you care about the environment and about cities. I think it then transcends architecture, but it is an entirely different discipline. But in the trajectory of your professional career, it's a kind of vortex that you have to sort of try to avoid.

For those with less experience or less desire to be working on master plans, the practices of drawing and the drawings themselves enact an unbounded present, a vortex, 'repetitious operational time, stretching endlessly into both the past and the future' (Rayner 1982; 260). Some sense that working on master plans may 'derail' them from their chosen career path - one that many of their peers in the company are on. Tim explained that he is learning a lot through the project, and thinks he has acquired the skills through which to better understand and make master plans. He explained that he had actively avoided master planning classes at university, because the teaching seemed 'relatively naïve, as if planners retain only a top down

view on cities,' and he preferred architectural design courses in which 'the work of architects seemed to guide spatial design'. He stated:

Honestly, it is more interesting and complex than I thought. I wasn't aware that there are so many different types of master plans, at different scales of practice, or how much they evolve from the early days of research and conceptual design through stages of development. But I know I don't want to keep doing this. I find the technical aspects of building design more challenging and more satisfying. Master planning is a good opportunity to expand my professional experience as an architect, as I may design buildings within someone else's master plan in the future and will use the skills I now have.

However, he later expressed an apprehension about 'getting stuck in master planning projects':

Once you're in, it's difficult to find your way back to architecture projects in the office, as you are recognised for having skills and experience in master planning. Not to mention that projects may go on for many years. I was told that it would be probably only be around 12 to 15 months, so at least it isn't like other ones in the office that go on for a few years. But for one year, I thought this could be interesting.

As architects draw, the tentative nature and uncertain future of master plan drawings seems to distance some practitioners from their imagined profession. Entangled in the time that drawings take is the experience of present time stretching into only an immediate future. While the drawings remain unfrozen, the time of team members continues to be resourced to the project, and they cannot move to another. Present time in the studio is filled with the laborious undertakings of making drawings. As team members draw and redraw, they

perform multiple steps of verification, calculation, coordination and imagination. They carry paper from desk to desk for discussion; they call the engineers for clarification, update excel sheets with area schedules, and refer to written codes. They zoom in to draw details and ensure that every line is drawn correctly and then zoom out to see the space produced and the overall graphic effect. They prepare drawings for print, for email, for integration into other documents, and discuss them during numerous reviews and meetings.

Although drawings enact flexibility throughout the planning process, in everyday practice, they require intensive work and resist change. Furthermore, the adaptability and absence of representational certainty in the drawings embodies the very reason that architects cannot qualify while they make them. If as previously discussed, the experienced planner reads drawings by identifying temporal thickness (Nielsen 2014), for those who sense that they are stuck in the present, there may be a temporal thinness in the drawing – a repeated operational time perceived only as an ongoing present, without connecting to their past education or heading towards any material or professional certainty in the future.

Conclusion: Envisioning Futures

The drawings' active roles are embedded within an ecology of practice in which different processes are entangled, enacting sociomaterial contingency on the ground. Drawings emerge as multiple boundary objects, enabling coordination

between different actors, across moments in time and within the project team. They allow practitioners and stakeholders to capture changes and negotiate between the design process and the complex realities happening outside the studio. They bring future spaces into the present, rendering them close enough for inspection before they become elusive once again (Abram and Weszkalnys 2013).

Drawings shape a learning ecology that contextualizes and synchronizes forms of shared awareness in the project. The planning team off-loads their knowledge and imagination onto the common design space of the drawing (Salomon 1997). Planners teach and acquire skills through the making and reading of drawings, as they learn to reconcile the seemingly definitive representations of drawings with their embedded uncertainties. What experienced planners know, and junior planners learn is that what matters in drawings is their performative resilience, their ability to incorporate and adapt to unexpected changes. In the field, I tried to analyse the performative role of drawings in practice through my observations, as if I were uncovering an implicit abstract meaning, only to learn that experienced planners were reading drawings explicitly through their performative agency.

The multiple uncertainties embedded in drawings generate varied perceptions, largely depending on the time spent master planning through a career. As Jason, Mark and other experienced planners read drawings, they attend to their meaning not as stable artefacts for use in punctuated moments in a series of planning

situations but extended through temporal and spatial enactments of future materializations within present design spaces of encounter. For some architects, the uncertain material future of master plan drawings is perceived as a design anomaly. While for planners, in the everyday practices of drawing, what matters is relinquishing the modes of control of design to progress through planning's collective and discursive processes.

Drawings embody the uncertain social arrangement of planning as a discipline, a profession continuously defined and challenged through practice. Both the drawing and the discipline are deregulated by design to ensure ongoing adaptability in everyday practice: design stages are not formalized, drawings are perpetually renegotiated, and time spent master planning is not formally recognized by any institutional body. Careers in master planning are less synchronized than those in architecture, requiring active negotiations between the day to day time it takes to make plans, the company's resourcing arrangements and possible career trajectories. Learning planning through practice occurs not only in the continuous present time of drawing experience, but also in an accumulation of learning events such as reviews and meetings, in which planners become teachers and students, and the perceptions and understandings of a professional community are passed on (Eacott and Hodges 2014). Though the boundaries of planning as a discipline remain formally undefined, the historical knowledge and social commitment that manifest in practice are carried in these events, relating the operational experience

of master planning to the history of the profession, the company, the project and to future career imaginaries.

CHAPTER 6: REPORT

Companies often produce reports as interim or final deliverables in project based work. These documents synthesise analysis and design with the requirements of the clients and other stakeholders to generate one or more narratives for the project, as well as income for themselves. In planning, reports often tell the story of a project by consolidating the idea of the project, the site, the landowner and other stakeholders with a point of view on existing conditions and a focus on future aspirations. They embed the idea of a beginning, middle and end of the work process (Ochs 1997; Ochs and Capps 2001). The reports made by spatial planners explore the interrelationship between people and a specific place – or how to achieve goals for a site, be it a plot of land, a neighbourhood or city.

This chapter follows the making and use of reports in a consultancy firm specialising in spatial analysis and master plan evaluation through innovative methods. Their work practices focus on digital modelling and software development for spatial analysis, applying their tools to specific projects to consult on urban projects and in so doing, informing a continued exploration of different methodological approaches to the study of cities and their future. The planners in the consultancy are all highly skilled architects, urbanists and geographers, who had chosen to train in the methods used by the company either before they arrived or as interns. Most of them participate in the ongoing report-making practices of the consultancy, whose main deliverable to a client is the document.

As artefacts, reports constitute a range of practices that generate objects, brought together to compose a project narrative. In tracing the report as a distributed cognitive system, I draw on Riles's studies of documents that she regards as artefacts of activity where 'one lived through the patterns of the document' (Riles 2000, 83). Riles relates the document as artefact to the practices through which it is made, by focusing on the patterns embedded in both. In the sections that follow, I trace the report as an artefact and as logic that orders collaborative practice. I consider how reports embody compositions of different objects and practices, how they encapsulate social relationships through modes of distribution and preservation. The structure of the company suggests a hierarchical system, organising roles through 8 positions: intern, consultant, senior consultant, associate, associate director, director, executive director, managing partner. However, as this chapter will show, the reality emerged as a different structure, and my findings suggest that the report system configures the company's identity and social arrangements through a sense of stability and continuity. Contrary to the last chapter, where the boundary object was made as the basis for communication and collaboration (Star and Griesemer 1989), reports appeared to be creating social boundaries, ordering the exchange of information and knowledge, defining a strict realm of action, reducing conflict and setting unnegotiable standards.

Almost Paperless

The reports produced in-house are A4 landscape documents, ranging between thirty to two-hundred pages depending on the complexity of the project and the

extent of the clients' requirements. They are organised in the form of a narrative, to communicate analysis and findings to a client. On the bottom of every page is the logo of the consultancy, the names of the project and client. Cover pages usually show an image depicting the project, showing either the existing site or future plans. Inside the cover, to the left of the first page are the full contact details of the firm, and key contacts for the project, as well as a standard disclaimer concerning the appropriate use of the report and all liability exclusions. On the right is a table of contents, starting with an executive summary, followed by analytic sections, and concluding with recommendations. The executive summary provides an overview of the report, including the project background and the rationale for the structure of the rest of the document, explaining how the planners interpreted and addressed client needs and which methods they used for spatial analysis. The sections following are mostly graphic with brief, bullet-pointed explanations. They show images of digital maps, models, charts, diagrams, photographs and illustrations that study and analyse either an urban plan or an existing space to consider possible improvements. Sometimes forecast studies are included to assess what benefits different interventions would bring to local spatial, social and economic conditions. As a composition, the report brings together the conditions on the ground with the interests of the client, to outline how goals can be achieved and undesirable outcomes avoided.

The company preserves very few reports in hard copy. In fact, there is little use of paper in the studio at all. I notice this because my desk is next to Sophie's, whose

desk is unusually crammed with piles of papers and books. Her work practices appear different from those of the rest of the staff, whose desks are neat and almost empty. An architect by training, Sophie has been with the company for almost a year, though she has the sense that she is new and has much to learn before she reaches the levels of knowledge and skills that other consultants possess. She works continuously with paper and pen, taking notes, analysing her digital work, often sending files to the printer in the server room, leaving her seat only to emerge seconds later with paper in hand. Sometimes I hear her mumbling to herself as she writes down her findings, or mouthing numbers as she points to her computer screens before jotting something down on her hard copies. Other days, she picks up those same papers and transfers her findings from the page onto the digital file, reading them off to herself silently, and then entering them into her keyboard. Sophie is the only person I see consistently coming in and out of the little library located at the end of the studio with books for reference, which she adds to the stacks already on her desk. Her accumulations have no order that is discernible to anyone but herself and look as if they are ordered through a stream of consciousness of sorts, in an ongoing dialogue between mental and material engagement. Her paper collections define her space and are a personal source of reference, a paper trail of one.

Sophie's constant handling of paper makes her behaviour unusual in what is otherwise an almost paperless work stream; the slight use of materials in the studio space seems more in keeping with the company's software foundations and digital

practices, extending across the space in a general minimalism. Her material work habits make the other planners' few notebooks, reference books or loose-leaf paper seem spare, almost Spartan for a studio engaged in urban planning and design (Drazin 2013; Yaneva 2009a, 2009b). During my time in the company, I note only three times that paper is used at the centre of a discussion. Formal meetings are held in the conference room or library (if only a few people were in attendance, as this space could fit up to six people) and usually conducted facing a large screen or projection. Paper is also rarely shared or distributed. Each member of staff keeps their own notebook and does not photocopy or share their notes, while only one person is ever charged with writing up the meeting minutes and does so from their personal notes only.⁶⁵ Blocks of paper with the company logo are available for general use and made to be disposable, each sheet perforated and ready to be ripped off the block. As Kidd (1994) observed, note taking on paper is used as a part of thinking and remembering, and paper is rarely referred to once it has been written on.

The expectation seems to be for most of the objects and practices of work to be virtual and paperless, for resources and references to maintain a digital format and take up space only on the server. Paper is rarely consulted. There is no space for hanging or storing project work in paper formats, as paperless surfaces extend from

⁶⁵ In other firms that I have researched or been employed at, staff often share meeting notes with the person allocated the task of minute keeping, to generate the most comprehensive record.

the desks up along the walls. This differs from architecture and design practices where wall spaces are designated to sharing work in progress and presenting recently completed projects; practitioners hang lists, ideas, references, photographs, sketches, maps and plans side by side, switching, sorting and updating materials to facilitate creative collaboration and discussion (Cuff 1992; Drazin 2013; Farias 2015; Yaneva 2009a). As a newcomer, Sophie feels more at home in her previous material world and finds it difficult to adapt to her new digital environment.

Running along the longest wall in the studio are large built-in shelves that house unlabelled and disordered stacks of reports, rolled up posters, scattered documents and filing boxes. Lacking legible classification, the shelves are rarely approached; to be an object of constant use, bookshelves require a shelving system, a curatorial approach to decision making that reflects a set of choices ordering and classifying the past to form an archive (Bergman and Whittaker 2016; Pyne 2016; Yakel 2007; Zeitlyn 2012). Much like Sophie's personal space, these shelves serve as platforms for thoughts that have not yet been classified or organised and are kept in 'temporary holding patterns' (Kidd 1994, 187). In her study of knowledge workers' paper practices⁶⁶, Alison Kidd notes that these are surfaces across which thinking

⁶⁶ Kidd outlined her research and choice of informants on the definition developed by Drucker, who defined the knowledge worker as someone 'who puts to work what he has learned in systematic education, that is, concepts, ideas and theories, rather than the man who puts to work manual skill of muscle' (Drucker 2001 [1973], 147). She interrogates the definition, and seeks to add to it through her research, stating, that 'that the defining characteristic of knowledge workers is that they are themselves changed by the information they process. So, the workers interviewed saw their

actively happens as notes are added, thrown away or moved around to relate mental worlds with external realities, or finished with unfinished documents (Sellen and Harper 2002). Her work echoes Latour and Woolgar's (1979) observations of scientists' work in their seminal work *Laboratory Life: The Construction of Scientific Facts*, when they consider the significance of a desk space full of papers, as the physical proximity of different paper sources on the desk, reflects the relationships formed in the act of writing a report:

On the left is an opened issue of Science. To the right is a diagram which represents a tidied or summarised version of data sheets lying further to the right. *It is as if two types of literature are being juxtaposed*: one type printed and published outside the laboratory; the other type comprises documents produced within the laboratory, such as hastily drawn diagrams and files containing pages of figures. Beneath the documents at the centre of the desk lies a draft. Just like the drafts of a novel or a report, this draft is scribbled, its pages heavy with corrections, question marks, and alterations. Unlike most novels however, the text of the draft is peppered with references, either to other papers, or to diagrams, tables or documents [...] The desk thus appears to be the hub of our productive unit. For it is here that new drafts are constructed by the juxtaposition of two sources of literature, one originating outside and the other being generated within the laboratory. (Latour and Woolgar 1979, 47-48, emphasis in the original).

Just as Latour and Woolgar demonstrate how paper documents are enmeshed in scientific practice, more recent studies of work in organisations show that new technologies have been integrated into workflows, not merely replacing paper

value to an organisation being to understand a body of knowledge and generate new information from this understanding which changed either the organisation or its customer in a direct way. Consequently, they all described their personal work objectives in direct relation to the objectives of their company' (Kidd 1994, 186).

forms, but generating new practices (Dourish 2017; Orlikowski 1992, 2002). Desk spaces may seem clear of references, but papers are often replaced by multiple on-screen resources, easily moved around and used interchangeably. Meanwhile, elaborate search functions make it possible to store, order and access vast databases, while email and chat functions are now common platforms for knowledge sharing, embedded into workflow processes (Orlikowski 2007).

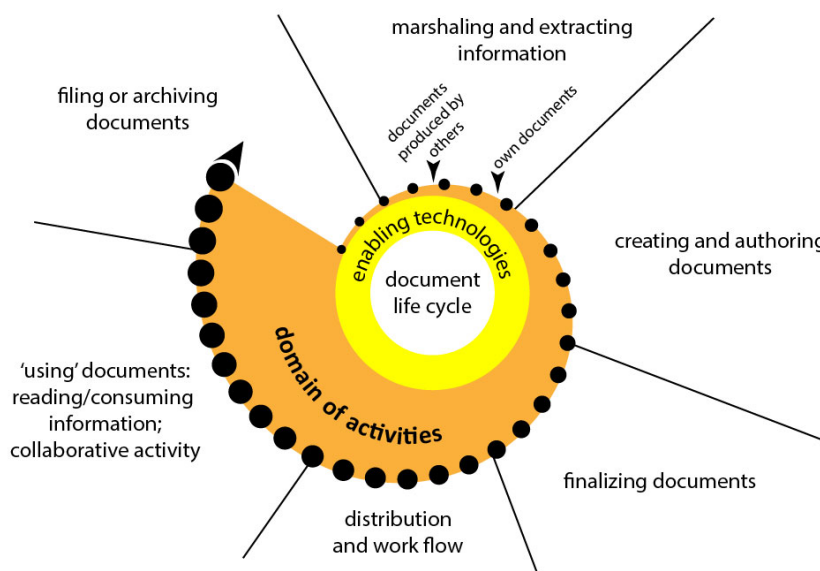


Figure 6.1: The document lifecycle
Source: Sellen and Harper 2002, 203; redrawn by author

In a study entitled *The Myth of the Paperless Office*, Sellen and Harper (2002) track how documents move and change materially through workflows. Following on from Harper’s earlier study inside the International Monetary Fund (1997), they consider the changes documents take on through different forms of making, storing and using, embodying variations in practices and social organisation. They call this

the document lifecycle, the process by which paper artefacts are transformed and manipulated through changing domains of activity (see Figure 6.1). Following Gibson's (1979)⁶⁷ theory of affordances, they consider how the possibilities of actions are embodied in paper's material properties:

The physical properties of paper (it's being thin, light, porous, opaque, flexible, and so on) afford many different human actions, such as grasping, carrying, manipulating, folding, and in combination with a marking tool, writing on. These affordances of paper, then, are about what people can do with paper. If paper is used to make different kinds of objects, those objects take on a different set of affordances. For example, bind the pieces of paper together into a book, and it affords flicking through and reading from. Its fixed arrangement of pages affords placeholding and knowing where you are within the book (Sellen and Harper 2002, 17-18).

The affordances of digital documents, their design and social implications have been a subject of study and theoretical debate (Murray 2012). Contemporary studies consider the interrelationships between the digital and the material, as one exists within the other, and in many organisations today can be difficult to dissociate one from the other (Dourish 2004, 2017). Kallinikos et al. (2010) provide a profile of the functional characteristics of digital artefacts by emphasising their differences from physical objects. They argue that digital objects are editable, interactive and open, and thus remain available to modification, whether systematic or irregular (see also

⁶⁷ In his studies of visual perception, J.J. Gibson (1979) argues against a disembodied account of perception couched in terms of the cognitive analysis of visual stimuli. He argues that visual perception is performed by animals and humans who are situated within and moving around in the world, and that this embodiment is fundamental to their visual experience. The affordance of the object in the world is a relational property – it relates the environment, the perceiver and action.

Manovich 2001; Weinberger 2007). Their distributed nature means that they rarely originate or remain contained within one source or institution (Haider and Sundin 2010). Embedded in their form is often a temporary composition of different parts, assembling different forms of information and functions; digital objects lack the physical borders of their physical counterparts, as their significance as artefacts needs to be defined and maintained within their virtual network. A digital artefact, therefore, embodies a combination of other items, work processes and software, a distributed property that accentuates fluidity and a continuous assessment of alternative states. In making an artefact, the emphasis shifts from its unique domain, to the practices and interactions that bring it into being.

Dourish and Mazmanian (2011) explore how digital artefacts are embedded within practices, and throughout the organisational fabric, developing their own logics of practice. Dourish (2017) eschews the dematerialised approach to the modern information or network society (Castells 1996; Webster 2005) to consider the different modes through which the digital is material. He investigates the material properties of digital representations as they 'constrain, enable, limit and shape the ways in which those representations can be created, transmitted, stored, manipulated, and put to use' (Dourish 2017; 6), and considers how the social and material are entangled wherein 'the materiality of the digital shapes the cultural experience we can have of it and the purposes to which we put it' (ibid., 26).

I draw from these ideas to trace the various material incarnations of reports - digital and physical – as they are conceived, composed and preserved. I allude to the work of Riles, as she relates documents as artefacts to the practices through which they are made, by focusing on the patterns embedded in both. She describes documents in the United Nations as perceived in two different states of concreteness; concern for the document alternates between how it captures a specific process of making a single artefact, how language and structure refer to past documents, and the possible effects a document can have on practices of making future documents as they perpetuate a pattern language. In her later work, *The Network Inside Out*, Riles (2000) follows how social practices of networking and negotiating are constituted by the form and language of documents. She considers how standardised structures in the text dictate an organisational logic to meetings at the 1995 United Nations Beijing Conference on Women, focusing on how negotiations shift attention from the document as a unique object to the embedded patterns of language and form linking it to other UN documents. Sets of social relationships are made and practised in relation to the organisation of the document, revealing that the aesthetics of the document are not merely representative of or analogous to practice, but that social actions are embodied in the chapters, headings, subheadings, paragraphs and brackets of the text (Riles 2000, 2006).⁶⁸

⁶⁸ Riles's ideas continue on from other anthropological and sociological studies that shown how both routines and the artefacts they generate structure and shape a narrow field of view through which to reflect on work (DiMaggio 1997; Giddens 1984; Scott 2013; Suchman 1995).

In the following sections, I consider how reports and practices report making are embedded in the social and material organisation of the company, how their affordances shape and are shaped by everyday practice, framing identities within the social order and configuring the future of the company. First, I focus on the digital workflow of report making, following the apparent seamless movement of people, tasks and information across the studio space, to consider what patterns of everyday order and distribution are embedded in the document. I then study the role of paper reports within the history of the company and the making of company identity.

Production and Distribution

Reports are the main output of this company, and report making is mostly a digital activity. During the working day, the presence of the planners' digital objects is made palpable by two sounds echoing in the studio. Gentle clicking sounds emanate from each computer mouse used by planners working on graphic content, as they make digital models, drawings and images. Typing noises, the soft but continuous tapping of keys, comes from those computers and laptops where staff are busy writing emails, documents, spreadsheets, charts and proposals. Both sounds characterise report making as a process of assembling visual and textual elements to generate the narrative presented in every report document; the report is the project, collecting all other products into it. As planners circulate the virtual artefacts that eventually come together to form a report, each object seems to

possess a digital fluidity. Overall, directors in the company describe their practices as inherently flexible, open and informal, as one of them explained:

Flexibility, well it's in our DNA to be flexible ... This place is a laboratory. But one where our clients aren't commissioning research. Here our clients commission a product, but our approach is often highly experimental, and we take them on a journey. The reason we experiment is because we're never happy with the answer that we would give them in the first instance. In that regard, I suppose we're not unlike architects because I think an architectural studio is an equally experimental place - perhaps where clients, especially experienced clients, do understand that in order to produce the final building, the architect will go through often a quite radical experimentation process. And perhaps because so many of us have had architectural training and experience, to have seen this for ourselves, it is sort of how we behave. We behave as both architects and research laboratory scientists. I have a growing confidence in this informal, flexible, agile approach, perhaps amateurish approach – it is a good and valid approach and being slightly off-piste is the kind of company we want to be.

The report document is made in PowerPoint, a software that helps to maintain flexibility in the studio, by keeping the final product of every project accessible to every member of staff – in terms of possessing the software and the skills to ensure ongoing editability. While the original purpose of the software was to design slides for digital presentations, in this company, the staff use PowerPoint to generate reports for presentation and print, every slide eventually becomes a page in a paper document submitted to the client along with its respective digital file. The directors see PowerPoint as a flexible tool with which to ensure the completion of a project meets company standards and expectations while maintaining the efficient distribution of work in which everyone can do everything. During a directors' meeting, for example, there was talk of hiring new staff, and the question was

whether to interview more planners or to bring in additional support staff. Although the voices were very divided the comment that ended the discussion was: 'We need to stay flexible, and the only way we can do that is if we can all do all of the tasks. What if we have a lull in marketing - will we pay someone just to sit around? We need more people who can work on a project and on marketing'.

Associates and associate directors are most often tasked with running projects and managing the day to day running of report making (depending on the project, more senior directors may intervene). They begin to construct the narrative of the report from the early days of the project, as they write an initial proposal written for a potential client. Proposals are usually written after meeting with the client and once the group of directors decides to pursue the project, having evaluated its suitability to the company's methods, its ethical implications and possible risks, including the chance that payment won't be made or that the name of the consultancy could be misused or misrepresented. Once the decision is made to pursue the project, the associate in charge will outline the scope of works, time frame and fee. As a framework for future work, the proposal outlines a methodological process in relation to the initial question that defines the project. One associate described the four ways in which report making is enfolded into the proposal:

- Interpreting the client brief and unpacking the urban analysis required, the proposal lays out the questions that the report will answer. The proposal writer considers what methods and tools are encapsulated within each of the questions, choosing both the means and ends of the project and the narrative of

the report. Although elements of the narrative are developed analytically, several associates noted that for the most part, it follows the ideas outlined early on.

- Establishing the analytical targets for technical work, the proposal establishes time and fee allocations for consultants, including decisions on the level of detail at which consultants will make models, maps and charts, what software they use and what procedures they follow. All these digital objects are made, assembled and then inserted into the report PowerPoint file.
- Organizing the directors, budgeting time and money for in-house reviews and client meetings, the proposal writer assesses the scope of principal staff involvement. They infer how much time directors will spend engaged in client relations, analysis and report writing.
- As associates and associate directors write the proposal, they assess their future role in the project, forecasting how much of their time will be spent overseeing and distributing the work, and writing and composing the report. Many describe their role as striving for balance, mediating between the consultant's work, the expectations of management, time constraints and client needs.

Associates and principals divide the labour of report making through weekly negotiations and redistribution. Report making is part of the ongoing project driven structure of the company, and multiple reports are ongoing at any given time as projects run in parallel. Allocating staff to tasks is complex because there are no project teams, and thus an ongoing circulation of responsibility among the consultants, beginning with the Monday morning management meeting. On my first Monday in the office, I arrive at 09:30, the official opening hour. The office is quiet, and only half of the desks are occupied by consultants working quietly at

their computers. The vacant desks belong to the directors and associates, whose muffled voices I can hear. As I line up with several others at the coffee machine to get our morning dose of caffeine, June, a consultant, asks me 'Can you hear them in there?' tilting her head towards the conference room. I nod and she continues, 'They are negotiating over which one of us will be on their projects and when. It's like a market; they are bartering over who will get the best consultants'. Every week begins with this resourcing meeting, during which directors and associates sit behind closed doors in the conference room to organise the week ahead, allocating and dividing staff time across live projects. When their discussions conclude, someone comes out to the studio, stands at the entrance to the room and calls in the rest of the staff with 'we're ready, please come in', or something of the sort. Consultants promptly drop what they are doing, pick up their notebooks and pens, and file into the room in silence.

In the middle of the conference room is a large round table, surrounded by ergonomic conference chairs, where the principals sit: the executives and directors, with associate directors and associates sometimes just behind them if there is not enough space at the table. Their chairs have wheels and can easily be adjusted to face the direction required. Walking in now are the senior consultants, consultants and interns (in this case, me), carrying notebooks and pens. There is a sense of a choreographed scene, a dance, a ritual - formal, traditional, repetitive, performative

(Bell 1997).⁶⁹ Nobody told me what my part was to be, but I learned by following, as I suspect others had done before me, and every Monday, participating in the meetings became part of my practice too. I learned my place, my role and purview easily, by following others. We enter the room in silence, quiet hellos are sometimes exchanged, but most days the conversation around the central table continues uninterrupted. We pull two large wooden benches from under a long wall shelf, and sit down in a row, single file, facing the others. The spatial divide is schematic, strict and unapologetic, with decision makers in the middle facing inwards, and the rest along a hard edge, peripheral to the proceedings, waiting for the core group to acknowledge them (see Figure 6.2). Some use their feet to turn and roll their chairs to a position from which they do not have their backs turned to us, trying to be polite, but in the end, facing no particular direction at all.

⁶⁹ During my months in the company, the managing director tried to make changes in this ritual, complaining that the meetings lack an inspirational and energising tone. He and the other directors attempted to improve the meetings' ambiance by focusing on changes to the order of events. For example, they tried to flip the meeting – to begin at 09:30 with all the members of the practice, and then ask the consultants to leave, and after them the associates to leave, with only the directors remaining for their strategic discussions. To implement these changes, the directors and associates issued a draft of the excel time sheets on the Thursdays prior, thus removing the need to for a bureaucratic style of schedule reviews first thing in the week. The changes created an array of other difficulties. The staff was not used to be in at 09:30 for the meetings, and most days were late. This was also the time scheduled for the fire alarm to be tested, often disrupting the meeting. Finally, planning the week ahead of time meant that many changes still had to be made and schedules renegotiated before Monday. The advantage for me when the meeting order was changed was that the directors reconsidered my access and gave me permission to stay on with the associates, and only left with them when the executive and associate directors met.

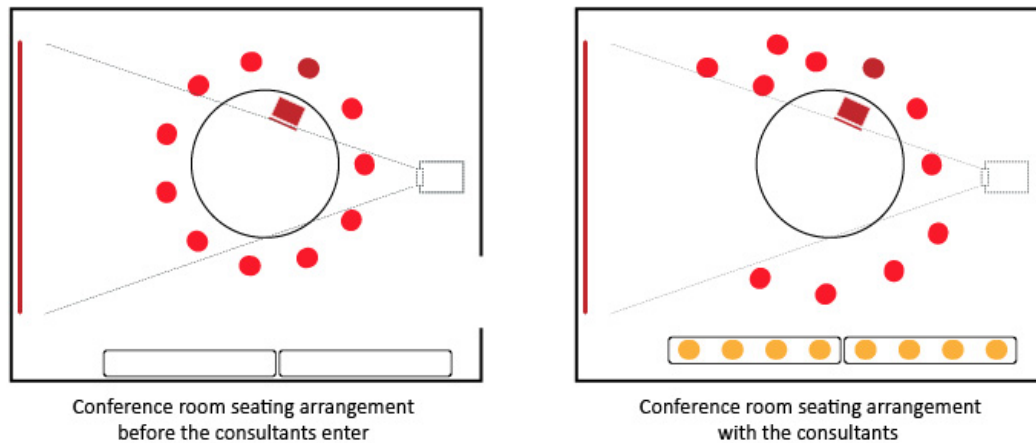


Figure 6.2: Conference room seating arrangement before and after the consultants enter. Around the central conference table, are chairs for the executive directors, associate directors and associates (red). The chairperson of the meeting (dark red), with the highest ranking role in the room, leads the meeting and controls the screen view with the laptop. The consultants (orange) sit on the benches along the wall perpendicular to the screen. Source: Author

After a short introduction to potential and new projects, and other general news in the office, an excel spreadsheet for the week ahead is projected on the back wall of the conference room, perpendicular to the bench. Its position forces all the consultants to bend forward or back to improve their line of sight. The projection shows the distribution of time and work between the consultants for the week, with different colours in cells representing half days allocated to making parts of the report. Referred to by their initials, staff hours are shown for the week ahead, as bits of projects are divided and coordinated across the week. A continuous line representing principal's time contrasts with the parcellated units of the consultants' time. The directors' time is coloured in by day to indicate when they will be travelling, at home, or in the office, as they maintain detail of their personal schedules in Outlook.

During the meeting, the chair moves the mouse pointer around the projection, using the Excel paint bucket tool to move colours around the grid. Several minutes are spent reviewing any scheduling conflicts and meetings. The chair then shifts attention to a corner of the spreadsheet to a cell in which it says Review and asks if anybody would like to schedule a review this week. Review meetings take place every Wednesday morning, during which 45 minutes are allocated to each registered project to present and discuss their project methods with one of the executive directors or managing director. Associates and associate directors state what projects of theirs they would like to review, and the chair makes a list of projects by colour. Next to each of the colours, the chair makes a list of all the initials of those who will attend, including the project director, associate and consultants, if they are available that morning for that project. The chair wishes everyone a good week, and the meeting ends.

Dourish (2017) would call this meeting a spreadsheet event.⁷⁰ As a form of document, the spreadsheet shifts from being a mere tool incorporated into the daily running of the organisation, to the central object around which a meeting takes place, integrated into everyday practice. The materiality of the spreadsheet, its form and logic, embeds the possibilities of how people work with it. He notes that among its most prominent devices is the expansive grid of cells. Each cell is a

⁷⁰ Dourish mirrors Knoblauch's (2013) term Powerpoint events, those meetings structured around digital slideshows

unit that organises; information is aligned, associated and separated or divided by cells. The grid pattern provides a convenient structure through which to construct lists or tables, to order, perceive and navigate across information and to facilitate manipulation by copying, pasting, stretching, deleting and merging grid cells, columns and rows. Every spreadsheet enacts a set of rules that enforce a relational link between each cell (sometimes through formulae), giving meaning to the granular rectangular form in organisational practice. The spreadsheet event is one during which the document is edited, focusing the discussion guiding the meeting, as 'tentative proposals become documented decisions, and the colors, formats, and marking of the spreadsheet indicate the progress that has been made. At the end of the meeting, this same coordinative artefact becomes an archive of the event, emailed around the organization or stored on a networked file server' (ibid., 82).

At the end of the meeting, consultants file out the conference room and slowly return to their seats. The peripheral single file line comes apart as the consultants push the benches back to their original position against the wall, as though the grid of the spreadsheet disperses across the studio space, the coordination of small units across time redistributed across the grid of desks. Notebooks are placed back on the desks (often with few or no notes from the meeting), computer screens are switched back on, and everyone settles to engage with their assignments for the week ahead. Chatter begins around me as consultants keep one another up to date with their work on various report objects, particularly when their new schedule requires that they hand over their work to someone else. Handovers are made

possible through ongoing information exchange through the space to ensure consistency and continuity, and all members of the practice spend a good deal of time explaining, reviewing, and sometimes, re-doing.

I recall how on my first day in the office, one of the directors told me that desk space had been allocated with the aim of mixing different levels and roles in the company to encourage informal communication and a flexible use of space. Circulation space had been designed to allow access to every desk, with room for pulling up stools and chairs and conducting informal meetings around the computer screens. Desks are organised in parallel clusters of four tables. Stools are dotted around the peripheries of the space and left randomly about, for staff to pull up next to each other's desks to discuss a project, ask one another for advice, and share opinions. On Monday, after the management meeting, however, the chatter in the office does not seem unscheduled and informal. Rather, there is a sense that work is being handed over from one person to another, and the verbal exchanges form part of the distribution of work.

As people, tasks and information move across the open space, there is an apparent seamless nature to the relationships of people and digital objects they are making; an overall scene of communication and work seemingly flow with ease. Farias' (2015) describes everyday scenes at architecture practices in which a shared open studio space provides opportunities to interact, generating a constant flow of

information and knowledge across different projects and levels of expertise among the staff. He highlights that open space encourages interactions among all members staff, and that spatial co-presence is sufficient for everybody to initiate casual and creative engagement. In my study too, members describe the strength of knowledge sharing in the studio, one of them stating, 'There is an amazing pool of knowledge in the studio and a curiosity and constant interest in the methodology. There is always someone to talk to and ask questions to.'

What renders the work seemingly moveable from one desk to another, from one person to another, is the clear pattern through which all projects are organised. The company report template orders work by dividing projects into small discrete tasks that can then be associated with cells of time in spreadsheets. The template provides a standard graphic layout for reports in PowerPoint, establishing page layouts, text boxes, and font sizes and spacing. Different slide templates exist for various report sections; covers, executive summaries, and analytic pages each have their allocated layouts with empty boxes to be filled, ready to contain a piece of narrative. In this way, the report template embodies the idea that projects can be partitioned and distributed across an even grid of consultant-half days.

The template makes report making a distributable task because content is already ordered and coordinated through its PowerPoint file. Associates manage and annotate project time through the report template. The report file is the only

device by which to monitor progress the project, filling in the empty template boxes on slides, and as such, serves as the coordinative artefact throughout the process of report making. Without a collaborative tool to oversee project timelines, manage deadlines, lay out milestones, and oversee and visualise development (such as a Gantt chart⁷¹), the report serves as a notation of time passing. The template file provides the rules and structure through which to monitor progress and quality within the seemingly flexible work stream (cf. Krause-Jensen 2010).⁷²

The template enables all project leads to pick and choose from different moulds for reports and to piece them together using standard layouts. As a digital system of replication, they frame how reports are made and therefore how they are conceived. The report and its various components are the only deliverables submitted to the client, and therefore shaping the report also informs how projects are conceived. Despite being a popular tool in the contemporary workplace, the extensive use of PowerPoint has been shown to have changed the nature of work processes (Kaplan 2011; Tufte 2003; Yates and Orlikowski 2007; Doumont 2005). While the original purpose of PowerPoint software was to design slides for digital

⁷¹ Modern day Gantt charts are commonly used to manage projects in a team and provide a visual device by which to track and display project development.

⁷²In his ethnography, 'Flexible Firm: The Design of Culture and Bang & Olufsen', Krause-Jensen (2010) explores organizational notions of flexibility and questions the freedoms that the term often alludes to. Within Bang & Olufsen, he traces changes made towards a functional flexibility, interpreted as the reduction of 'bureaucratic rigidity and hierarchy and encouraging initiative and employee responsibility (Smith 1997 in Krause-Jensen 2010, 251), and implemented as a move away from an order of departmental divisions towards a network structure, or a 'system of social relations' as opposed to a 'corporate body', as described by John Barnes (1954).

presentations, Yates and Orlikowski (2007) argue that its inherent logic of linear structure constrains collaborative practices and shapes regularities. Kaplan (2011, 321) further demonstrates that as a tool, it is 'part of the machinery that produces knowledge'. Dourish (2017) briefly considers his encounter with the use of PowerPoint slide decks – the library of slide templates used to format documents - stressing that these slides are not presented or discussed. He states that 'nobody stands at the front of a room, laboriously working through the bullet points – but the well-understood genre of the PowerPoint presentation structures the way in which information is gathered and entered – direct, punchy, and organized by slides and bullet points, which might themselves later be extracted or rearranged' (ibid., 98).

Similarly, the group I study rarely discuss the PowerPoint file and do not see the report as their main product. Despite how report making guides everyday work, the directors see their products as multiple and complex, including teaching, software development, design and spatial analysis. Directors explicate the use of PowerPoint as a source of openness and distributedness; the only graphic software that all the principals know how to use and have access to across all laptops. Changing to more specialised design and layout software would place limitations on the existing workflow: the high cost of changing would restrict the number of computers to have the new programs installed, and the increased level of skill necessary to work the complex software would render report files less distributable and editable.

Maintaining a high level of distributed editability for report files suggests that repetition takes precedence over customisation and innovation. While it is not unusual for a company to standardise graphic outputs and to preserve a consistent visual identity, the few slide templates render report layouts difficult to customise and a challenge to adapt to projects. Document set-ups remained unchanged, irrespective of the shape of the site or scale of the project, and inalterable to client needs or analytic developments. For design and planning offices, the use of PowerPoint as a primary layout and communications tool is rare, because it is notoriously awkward to use with precision, lowers image resolution, and the strict sequential order of slides makes it difficult to navigate large projects (Marcus 2005). One consultant returned from a meeting one afternoon and exclaimed, 'Our reports look so old fashioned and so inefficient! It's just embarrassing to work with other design firms. Now I need to re-do our graphics to suit their report and submit all the images individually.'

Furthermore, the temporal and spatial divides of information and bullet-pointed text foreshorten the link between evidence and thought (Tufte 2003), a mode of practice seemingly embedded in the organisation of work. The commitment formed during the proposal stage is not easily altered. It pre-determines the level of analysis that the report will present, and entangles an analytic logic to data collection, methodological choices and the division of labour by skills and experience. Associates also sense that the proposal stage is often underestimated and rushed, despite its importance to the report:

There is a lot of pressure to get it done quickly and everyone seems to have a template of what to do. It's like a tick-box order of studies, diagnostic analysis and design testing and sometimes forecasting objectives. There is little time for exploration - because you need to get the fee right - and it probably needs to be a low fee, so affordable. And when you're talking about an approach on a project, you really need to think about it, and have enough time to understand what it is, first work out what you're going to do, and then explain it properly to someone who is not as familiar with the method as us. So, that stage of the project is really important. And that gets completely squeezed out. There's just no time. When we talk about new projects in the pipeline, we don't review our approaches, and that sets the tone for the rest of the project. Most of us have a way we like to do things, and the report template allows us to do that.

The structure of the report is planned and built around one or several questions and constructing an answer. The review meetings are the time to engage with the questions. In the little library at the end of the studio, around a table and facing a large television screen showing the project's models and charts, these meetings are often an important time for consultants to assess their work and deliberate methods. Reviews offer the consultants a break from their work, often described as a checklist of tasks. Often, discussions are highly technical, and for consultants, a time to consider solutions to streamline or improve production. Many consultants spend time training themselves and keeping up with software innovations, their efforts tending to negotiate the company's established concepts and tools with change.

For some associates, review meetings are ineffective because they do not review reports as emerging artefacts. Although reports are ubiquitous within the everyday

practices of this group, they are not discussed as the company's product or main output but rather, as objects and objectives, they remain implicit in their analytic design and planning work. Depending on who is running the review, and whether or not they are already familiar with the project, much of the time can be used to explain the project, fixing technical faults or evaluating the calculations and analyses. One staff member describes a reluctance to attend:

We talk about what we do; we don't talk about what we don't do. Because reviews are usually methodological discussions, we skip talking about deliverables or goals. That should be done as we work, but we don't seem to do it anymore. We used to have more reviews - we had a start-up review, another about half-way, a financial review, we used to have closure reviews, and these have all been phased out.

Another staff member states:

Our research reports can be quite repetitive - you read a lot of our reports, we say similar stuff again and again. And because we only make things that will go into a report, the time for trial and error is short. I think that we forget that this is a way of asking questions about the space - I think sometimes we are more focused on answering a question, rather than asking more of them or changing our questions through the process of applying our methods.

The fragmentation of the narrative in the report template maps repetition and divides into routines of practice. The open space lays out report making, not as a flow of work but as a divide, and not as informal and agile, but as planned. The flexibility of the process and informal exchanges between staff members sometimes enacts a formal work distribution as without it, everyday processes of report making cannot progress. In fact, by institutionalising informality in communication,

the everyday patterns of report making generate an ongoing circulation of ideas and information and, with it, an ephemeral quality to everything produced in the studio space. The transitory nature of information and knowledge exchange makes most of the pool of knowledge inaccessible to those who are not part of the conversation (Foote 1990) and marked by fluctuations between engagement and disengagement with projects and ideas.

The spatial divide in the boardroom enacts the social organisation and division of labour of the company and its projects, extending a form of dissonance into the studio space (Nygqvist 2015). In the studio, the core group is highly mobile, and many of its members are often absent. Their self-exclusion from the spreadsheet makes their time and presence seemingly elusive, as their desks are only stopgaps in what is a temporal continuity between the studio and other spaces outside; their empty desk spaces are performative of their unavailability. As this group divides responsibility among their peripheral staff and shifts tasks between consultants, they maintain the distributed and editable affordances of the PowerPoint documents and reduce the work of peripheral staff to a punctuated linear order of tasks. Much like the cells of the spreadsheet, the division of the report into discrete tasks also cuts the consultant's time into short bursts of activity and small achievements, accentuating the gaps between the intellectual curiosity that brought them to the company in the first place, the technical and analytical skills they have developed, and the confines within which they practice. In the section that follows, I continue to explore how reports play a role in maintaining social

order within the company beyond everyday practices, perpetuating the gap between core and periphery through acts of dividing, directing attention and limiting reflexive devices.

Preservation and Loss

Reports generated through everyday practices in the studio seem to disappear into the opacity of a digital server once the documents are submitted to clients. As a newcomer and researcher in the company, I decided to spend some time reading completed project reports. However, when I try to navigate the server's digital project folders, I get lost. Without a managed system of classification or search function, I am unable to identify the qualities or characteristics of the projects without prior knowledge of them. Folders are organised by places and dates, sometimes with multiple projects in the same city, named after streets, developments or neighbourhoods. Most consultants I asked, sent me links to the portable document format (pdf) documents of projects they had personally worked on, whose folders they could easily navigate. Although an internal project filing system exists, without an archival logic or mechanism, the past is difficult to browse or to make sense of as a progression. References to the past happen from within the report template, echoed in their patterns and repetitive forms (Riles 1998).

The report template embodies a period of historical importance to the identity of the company. Developed during the financial crisis of 2008, the template's story

tells of the company's successes in adapting to the conditions of the crisis and securing its future. During the crisis, many staff were made redundant, the research and development team dissolved, and directors and others in well-paid positions took pay cuts to preserve their position; the focus shifted away from imagining projects and writing proposals, to fee earning and project completion. For the current directors, the template became the mechanism through which to generate projects quickly and deliver to a satisfactory company standard, by ensuring that everybody in the consultancy could have a hand in every aspect of the work and reduce the need for support staff and specialised roles. Being understaffed, the report template set a consistent standard of expectation and production while providing a mode by which to produce work efficiently, as one director explained:

When the financial crisis hit, we went back to the one team approach; we had to re-think. Our strategy was – let's try to keep everyone, especially the team doing consultancy, with the specialist knowledge, because they would be hard to replace and we had made the investment in their training and experience of these people. We were very cost-conscious, and optimised a lot of things, and we learned how to run the business quite lean, and now things are getting easier which is great. But I think we know now, that if there is ever less money, we know what we need to do. Perhaps it's not as scary as it used to be.

Having seen the company through the crisis, the core group holds onto memories of their early organizational vision as a laboratory for innovative developments in urban theory and planning practice, providing them a sense of security with their place as a consultancy. Among them are those who had been the first to put their analytic methods to use, members of the original team who had developed

academic ideas into projects in the real world and conceptually, they see the history of the company intertwined in their methods. They perceive themselves as having made a historical contribution to the continued existence of the company by accepting salary cuts and reduced work hours, and by having restructured the company and its work processes towards a leaner system. The template today is a historic schema of this adaptation to the risks of the financial crisis, a safety net of sorts, and a device through which to manage and adapt, reduce risk and create cohesion. It frames their position by providing the principals a way to ensure the survival of the company with only a permanent core staff, and should the need arise, the possibility of removing, reducing or changing peripheral staff.

Overcoming the crisis is central to the company's collective memory. Irrespective of how long members staff have been with the company, they all tell the story of how the company survived the crisis in their interviews. I observe how the history of the company is retold during several events; the principals call the staff to the reception space at the front of the office where drinks and cake have been brought in to celebrate both personal and company occasions. After the principals announce the promotion of a colleague during a company meeting in the conference room, the rest of the staff is asked to reconvene in reception for a toast, and when the company announces a new financial structure, all members of the studio are asked to gather at reception to receive rewards and gifts. Some afternoons, treats are laid out on the counter (usually at the request of one of the principals) near the receptionist who promptly sends out an email blast to let the staff know.

The reception space is set apart as the place where a few paper reports and other historical material artefacts are preserved. Framed on the walls are images from a project completed years ago, and the handful of report examples are carefully laid out on coffee tables. In contrast to the informal feel of the old urban industrial feel of the studio, the reception space is polished and formal. The reception desk is high, its dark marble finish hiding the receptionist's screen, notebook, mail and other papers. The marble sits on a dark concrete floor, with a white partition wall behind, it separates the front and back of house. Across from it is a wood-clad partition wall and wooden floors. This is the space that welcomes guests to the office and where public relations and marketing takes place. The separation of front and back of house is not uncommon in planning and design companies; most projects are confidential, uncertain and possibly contentious, and must remain hidden until they are fully in the public domain.

Memory is constructed through events that break with everyday routines in the reception space (Kuchler 1999). The significance of this entrance in relation to the studio space behind, may be read as a place where shared memories and a company identity is constructed and maintained as a coherent historic narrative and sense of place among other planning consultancies. The white frames encasing images from past projects are the same as those in the conference room in which lithographs by a famous artist are displayed. Up to date industry magazines, a good coffee machine and bags of 'the best coffee in London' contribute to a sense that

this is not only a formal space, but a highly curated one. The material sensations of the reception space - smell of the coffee, the formal design finishes, the empty corner of the desk on which sometimes there was cake or biscuits – all possessed an almost Proustian form of recollection, an involuntary memory, not unlike his eating of tea soaked cake as it brought up memories of his childhood (Proust 2013 [1913]).

No digital projections of everyday work are displayed in reception, and paper reports exist only in the realm of the permanent, formal and finished artefacts. The paper reports participate in the design of the space where the passing of time is marked with transitional milestones, events lined up to form a meta-narrative of the company. The reception space and the artefacts in it link the past epoch of crisis with the existing social arrangement of the company, shaping the memory of the past as it informs the present. Anthropological studies of social memory engage with ideas of living histories, wherein shared constructions of memory are not only recollections of the past but how ‘a particular past perseveres because it remains relevant for later cultural formations’ (Olick and Robbins 1998, 129; see also Battaglia 1992; Berliner 2005; Guggenheim 2009). The anthropological and sociological treatment of memory as a social and collective domain, rather than contained in the mind of an isolated individual, is attributed to Durkheim (though he did not use the term collective explicitly, see Misztal 2003). Durkheim argued that society needs an understanding of continuity with its own past and that the past as a shared memory, in turn, grants both individuals and groups their identity (Durkheim 1912).

Durkheim's student, Maurice Halbwachs, later published a seminal study on the basis his teacher's ideas, entitled *The Social Frameworks of Memory* (1994 [1925]), where he explores how memory is a manner in which minds work together, and frame social arrangements, stating: 'It is in society that people normally acquire their memories. It is also in society that they recall, recognize, and localize their memories' (Halbwachs 1992 [1950], 38; see also the work of developmental psychologist, Vygotsky 1978 [ca. 1930-1934]). In *The Legendary Topography of the Gospels in the Holy Land*, Halbwachs (in Halbwachs 1992 [1941]) argues that symbolic and ritual actions organize social memory, thus enabling the past to bear on the present. More recently, Pierre Nora has argued that 'collective memory is what remains from the past in groups' life, or what groups do with the past' (Nora 1972, 398, translated in Berliner 2005, 201), focusing on how certain histories persist and shape the present (see also Goldhenson 2001).

Mills and Walker (2008) address how memory, space and materiality intersect (see also Hendon 2000; Joyce 2000; and Michaelian and Sutton 2013 for a review of distributed cognition and memory theories). They use the term memory work to refer to the social practices that construct memory (as in Berger and Luckmann 1966), wherein material engagement generates patterns of relationships, and that 'once understood within their cultural contexts, all material traces are the residues of memory-making relationships, albeit in different social, spatial and temporal settings' (Mills and Walker 2008, 4). In these studies, memories are not passively

experienced but actively shaped and reshaped in everyday practice (Jansen 2007; Litzinger 1998; Stoler and Strassler 2000) and distributed across socio-material systems as they track of changes outside in the world and form internal representations within the group, as it curates its own past (Sutton 2009).

The absence of a curated archive of reports enacts a material decision on the part of the principals in shaping the company's collective memory. It seems that past reports are not included in the fabrication of memory, and knowledge of their making remains with those members of the group who had participated in making them. Lacking reference materials of the company's methodological history, the identity and history of the company is informed as much by forgetting as it is by remembering. In the process of report making, ongoing verbal exchanges in the studio allude to a pool of knowledge and support, however there is also a sense that ideas and methods are easily lost in informality, and not easily retrieved.⁷³ To have access to information necessitates a form of co-presence; being present in the office when knowledge is exchanged, or knowing who in the studio had been present and can relay information.

Social practices of forgetting have been shown to be as deliberate and curated as acts of remembering (Zerubavel 2012). In his seminal work *The Nuer*, Evans-

⁷³ For instance, one project is singled out as having uncovered a method and software plugin that had been developed by in-house consultants six years prior but forgotten once they had left.

Pritchard (1940) traces the functional purpose of selective memory in social accounts of lineage and practices of socio-economic organization. He observed that the Nuer people recall only their founding generations of ancestors and the most recent ones, creating a historical void in between. The purpose of forgetting ancestors, he shows, helps to sustain Nuer society as it supports internal regulations: a number of recent generations are remembered to ensure that incest in marriage does not occur. However, cattle exchanges occur through marriage and are crucial to their economy, and in their small society, noting too many generations of ancestors would result in too few transfers of resources (Evans-Pritchard 1940; Rayner 1979; 1982; Douglas 1980). Evans-Pritchard shows that the 'telescoping' acts of perceiving lineage (Evans-Pritchard 1940, 199) are selective accounts of the past that reinforce and stabilize their community, made possible by practices of forgetting 'uncomfortable knowledge' (Rayner 2012a; Douglas 1980).

A student of Evans-Pritchard, Mary Douglas states that forgetting can serve as a tool for authority, and that it 'includes different kinds of selective remembering, mis-remembering and disremembering', and is just as necessary as memory (Douglas 1995). In *How Institutions Think*, she shows how social organizations rely on their ways of classifying and ordering their past in order to make sense of themselves as a group, stating that 'Any institution ... starts to control the memory of its members; it causes them to forget experiences incompatible with its righteous image, and it brings to their minds events which sustain the view of nature that is complementary to itself. It provides the categories of their thought, sets the terms for self-

knowledge, and fixes identities' (Douglas 1986, 112). Rayner has explored more specifically those acts of exclusion from memory when certain facts threaten to destabilize the orders that supports organizations in their pursuit of certain goals (Rayner 1979; 1982; 1986). In his study of The Workers' Institute of Marxism-Leninism Mao Xedong thought (1979; 1982), a small Maoist sect in London in late 1970s, Rayner demonstrates how a foreshortened experience of time through epochs generates a shrunken view of the world that justifies how the group isolates itself from the rest of the world. The sect sees itself as a direct continuity of past epochs, and in its narrow view, leaves little room for re-interpretation or questioning of its values, as others had done through history (see Chapter 1 for a broader examination of Rayner's theories on perceptions of time and space).

In this case, the historic presence of the core group guards their role as the gatekeepers, and keeps them from being challenged by others, who have spent less time in the company. The conceptualization of company history and the absent artefacts represented only by the framed and bounded few at reception, form a permanent and seemingly impenetrable narrative of the core group. The organizational divide manifests as a temporal boundary between core and periphery, as one member of staff explains:

Basically, there are two realities in the company. There is one that only works at a certain height top managerial positions. They are very inward looking, and they see everyone else as possibly more transient. Do they wait until people have put in five years? Eight years? When does someone become a permanent member of the company? And then you have the other one, a kind of weird misshapen creature that sits and waits around the bottom.

The absence of an organized and inclusive repository of the past forms a seeming disassociation from the very possibility that an archive of reports can be a collective resource that is actively grown, shaped and adapted to through ongoing work practices, thus excluding everyday practice from the narrative, and leaving it uninterrogated. Report making routines seem to fall away into a perceived continuity of activity embodied in the template. The present is ordered and regulated in the report structure, its repetition perpetuating the sense that every project is related to others; projects are not treated in isolation, but classified by staff by how typical they are, how easily they fit within the template and possibly, how readily they can be interwoven into the continuous story of the company (Heimer 2006). One staff member explained:

There is a general sense that there is one right way to do things ... We don't do a good job of getting into the local nuances. There is a typical project, and a typical report. For instance, we don't often include site specific details, like climatic, geological or even socio-economic and political ones.⁷⁴

⁷⁴ One project in the office, Project X, was unlike any other. Due to the long-term relationship with the client and consistent work flow over several years, this project had a dedicated team who worked on it continuously. They developed their own graphic language, using Adobe InDesign and Illustrator (more sophisticated graphic software than PowerPoint). The departure from the template embodied the project's shift away from other common practices in the office, keeping to their own schedule, with the project leader opting not to present at the weekly project reviews. Methodologically, the team had also shifted away from the norm. Though I studied this project and team and have used my findings in the writing of this chapter, I have not made them a focus to maintain the necessary level of anonymity throughout.

Importantly for planning practice, the unique characteristics of projects and sites are at risk of being overlooked or globally contextualized. Space outside the office is perceived as a continuous and congruent network, and report narratives are treated as sections of a methodological continuum. Sites are set against a background of other places, potentially limiting acceptable planning narratives and contradicting the very aim of the company's analytic methods.

Conclusion: Anticipating Futures

By dividing, directing attention and limiting reflexive devices, the reports play a role in maintaining the social organization of the company. In particular reports perpetuate a distinction between core and periphery, a social arrangement that contrasts sharply with the hierarchy that the company identifies with. Although this might superficially look like a hierarchy, the core and periphery model is evidenced by the absence of any kind of archival curation of the reports as a historical tracing of progress. The ambiguous storing of reports also is suggestive of ambiguity about the group's boundary as a whole, and the fuzziness of the boundary between the core and periphery demonstrated by the celebration held in the reception area, which is itself a liminal space between the organisation and the outside world. The rituals of the Monday meetings are also indicative of a core-periphery model. As the meeting chairperson presents the work distribution for the week, the spatial

divide of the conference room⁷⁵ is highlighted by the projection on the wall; only the time of peripheral staff is managed in the schema, while core staff exclude their time from the spreadsheet.

The lack of a formal, complete and inclusive repository of reports foreshortens the temporal and conceptual range of tools and methods in everyday communication. Despite the flexible and informal dialogues that are ongoing in the studio, knowledge transfer seems wedged between immediate preoccupations with task redistribution and restrictions of rituals and performative roles. Here, reports appear to be buffers between the core and periphery, limiting the exchange of information and knowledge, defining a strict realm of action, setting immovable standards and avoiding uncertainties and risks. The role of the template and adherence to the PowerPoint serves the core-periphery divide by distinguishing competencies. Just as in other fields (e.g. water management, see Rayner 2012b), technological innovation often enters organizations with more recently trained, peripheral staff. Senior managers in the core of the organization, meanwhile, are do not often become involved in technical detail, and continuously emphasise their conceptual and methodological knowledge and experience.

⁷⁵ In a hierarchical organization, one may expect seating to be allocated more discriminately according to rank.

Within the reports' patterns of form, there is little room for reflection on practice. As everyday practice is comparative in nature and dissonant in practice, and the preservation of only a few documents limits access to reference materials, the investigative and innovative nature of work among staff is reduced. Through the divisions that typify everyday operational arrangements of time towards report making and the control of historical narrative, the core group seems to strive towards a condition of caution and stability by insulating themselves and their methods. Distinct patterns of sense making are embedded in the reports; a controlled and unnegotiable past and a repetitive present, both of which embed and inform routines through which to imagine the company's future (Peck and 6, 2006). Isolating the present in an operational regularity, they imagine the company's future only through a collective social memory; what matters is the self-preservation of company identity. As Mary Douglas states, '[m]emory institutionalized is capable of anticipating future events' (Douglas 1991, 294).

CHAPTER 7: DISCUSSION AND CONCLUSIONS

[P]lanners are not people who lay hands on the physical world. They are not manual laborers planting sedum on “green” roofs or erecting the prefabricated walls of affordable housing units. They do not make the objects they plan.

Beauregard 2015, 7

This thesis posed the question ‘how do master planners think?’ specifically looking at: How do master planners collectively achieve complex tasks? How do relationships between the material and social in everyday practice frame perceptions of time and space, and how do these in turn reinforce or challenge sociomaterial arrangements? What conceptions of master plans and planning practices are made salient?

To answer these questions, this research has addressed the everyday practices in which artefacts are rendered almost invisible through routine, bringing them to the fore by defining planners’ tasks as making objects (Beauregard 2012, 2015; Lieto and Beauregard 2015; Rydin 2014). It studies how planners think as coordinated systems of distributed cognition in which teams of master planners make three objects – a model, a drawing and a report. In traditional cognitive research, coordination is associated with external stimuli while individual minds process and make sense of social activities. Distributed cognition, however, enables the study of coordination as collective sociomaterial processes when elements within a cognitive

system work together to achieve a task (Hutchins 2010a; Perry 2013). In this framework, the shared, interdependent and interwoven practices that form a common objective are often highlighted as modes of operation. To attend to difference and discern between emerging entities, behaviours and classifications that make up the entangled system of everyday practice, this thesis draws from Rayner's (1982) perceptions of time and space and Barad's (2007) theory of intra-action.

This chapter is organized in three sections. In the first two sections I refer to my findings from the three empirical chapters and synthesise them to answer the research questions. I consider the operational dimension of coordination through synchronization and social attention, through which I analyse the relationships between the material and social, and the co-constitutive perceptions of time and space. I then examine uncertainty as the salient dimension of planning that emerged in the findings and consider its role in the tasks and their systems of distributed cognition. In the final section, I reflect on my inquiry and its contribution to literature.

Coordination in Time and Space

In this study of master planning practices, material tasks are conceived of as framing sociomaterial arrangements and shaping perceptions of time and space (Rayner 1982), which in turn shape the conditions through which thinking and

making occur. The boundaries of each of the tasks observed – making the model, drawing and report - are constituted by the distributed cognitive processes that enable collective forms of operational coordination within. The boundaries are seen to enact a performative separation between their inside and outside spaces (Farias and Wilkie 2016; Farias 2015). Sociologist Antoine Hennion argues that the internal space of the studio allows multiple realities to be deployed and enacted and is a device with which to recreate and experiment with connections between different entities, conditions and constraints (Hennion and Farias 2016; Hennion 1989). The very idea of the studio is inherently a performative separation between the outside world and the inside in which certain qualities of complex external realities are isolated and attended to as a means of generating new configurations.

For example, the cognitive system in which the model was made enacted characteristics of the client, the site and the project within the space of the studio. The site – its landform, its infrastructural connections and development potential – were scaled down into the model, making its forms malleable and partial to design. The planners designed the model as a temporary configuration, an enactment of a completed project, as each of the material layers set out to perform a new relationship. The planners designed each of the model's material layers as a coordination between the inside and outside of the task. The road layer was designed to preserve the existing relationship with local government as the planners decided to maintain planned junctions for the time being. The landform was modelled in its existing form, to connect with the landscape and development

around the site. The building layer, was designed by the planners as the highest-density scheme that they would imagine for the site, to stimulate discussion and challenge the client to clarify the project brief. The model embodied a geographic conception of developable pieces of land that can be reconfigured into the landscape. The relational spaces of the project - between client and site, client and planner, planner and site, and planner and local authority - were internalized by the team and enacted in the model to configure their future design space. The planners selected which of the project's unknowns would guide the task and designed the model as a boundary object (Star and Griesemer 1989), foregrounding their uncertainties.

The drawing as a boundary object revealed a more dialogic relationship between the outside world of engineers, the client and investors, and the planner's internal studio space. The drawing itself enacted an open system to capture the project's design negotiations on paper and compose the different priorities and concerns of each of the actors into a single dynamic scheme. Within the drawing task, spatial perceptions cohere into relational patterns to coordinate between different simultaneous practices, helping the planners to adapt to unexpected change. The drawing mitigates the uncertain and uneasy paths of planning (Appadurai 2013) embodying an organizational device used by all the actors coordinate their design processes. Drawings emerge as both representative and performative devices assembling and enfolding future geographic spatial imaginaries into the present task.

Each of the cognitive systems observed generated sociomaterial arrangements of attention, or attentional socialization (Zerubavel 1997, 2015), that enabled teams to concentrate on and achieve their tasks collectively. In the case of making the report, the attentional system was highly divided and continuously redistributed across the company team and studio space. The report task was sequentially ordered into smaller activities and goals, mobilizing people and resources based on an established form of routine embedded in the report template. Spontaneous and informal discussions, though they seem to be outside the routine, in fact supported the pattern of synchronization, as they reinforced the studio-wide production rhythm and helped to ensure the smooth running of operational configurations (see Zerubavel 1979). The attention of peripheral staff was kept on modes of production while project managers and principals maintained the overview of the report and its constituent parts, retaining the capacity to evaluate the task. The template coordinated and synchronized the different activities and perceptions necessary to assemble the report. Temporal perceptions in the operational day-to-day coordination of tasks relied on forms of synchronicity, foregrounding the emerging artefact as a method by which to arrange practice (Blyton and Starkey 2017 [1989]; Lauer 1980; Lewis and Weigart 1981; Zerubavel 1976).

In the case of making of the model, the artefact's material logic arranged the planners' work into units of operational time, parcellating their attention and resources. Each of the materials delineated a series of smaller tasks required for its successful completion, established deadlines, and composed the necessary network

of people, skills, materials and machines necessary for making. The team could grow as necessary, with more planners, model makers, computer graphic artists and designers joining the synchronized tasks. The actions of model making entailed setting up time frames for every material layer and the deadlines for each of the designs in the studio depending on the times of production in the model workshop. Sketches were time stamped, and designs passed from one to the other as they formed. The task's temporal arrangement configured the model as a single object, combining the different spaces and modes of making into one by facilitating communication through a common attentional framework.

The operational synchronization of drawings embodies precarious relations as they attempt to capture the uncertainties on the ground (before there is a 'ground'). The temporal frames enacted in the drawing eschews any direct relationship between order and change (Hart 1976), as change is both an internal emerging process and an uncertain externality. The operational time of the drawing is malleable, one day set in a routine, another day speeding up to capture change, and on a third day, slowing down to consider the material futures represented. In each of these different moments, the imaginaries of the future are brought closer and closer to acts of coordination and negotiation taking place in the present.

This research shows that boundary objects do not take on performative roles only as completed artefacts, but enact cultural boundaries as they emerge, internalising

the other into practices of coordination and valuation (see Heuts and Mol 2013, and van Loon and Bal 2014 on valuations). The extended sociomaterial arrangements of planning and internal time and space are crafted together to generate meaning in devices that form continuity – between the task and the project, the project and the planners, the planners, other consultants and the clients, and the existing state of the site and ideas of developable space, among others. Artefacts emerge as modes of mattering (Savransky 2016), becoming material manifestations of the planners' everyday sorting through past experiences, expectations and future imaginaries, and present constraints and possibilities of the workplace. The cognitive artefact is therefore not a purely representative device that is operated on or merely affects human cognitive performance (Norman 1991), as often described in theories of distributed cognition. Rather, the artefact is a context-making apparatus that enacts and informs cognitive frames through which master planners think (Appadurai 2013; Law and Moser 2012; Barad 2013). The context-making agencies of artefacts lies in their abilities to constitute boundaries of practice, foregrounding the physical artefacts and their social practices, distinguishing between and weaving together nonlinear and incohesive perceptions of time and space into coordinated practices.

Uncertainty, Culture and Confidence

Each of the tasks studied revealed that embedded in the coordinated efforts of making artefacts are modes through which the master planners address uncertainties. The findings show that operational perceptions of time and space

relate to ways of engaging with unknowns in the present and future. In and of itself, the idea that planners contend with uncertainties is hardly novel, and planning scholarship recognizes that uncertainties are an inherent part of practice. In the field, I was able to observe the manifestations of uncertainties and how planners addressed them within the contexts of the tasks.

As shown in the review of planning thought, since the late 1960s the notion that certainty in process and outcome is possible, has come undone (Nowotny 2015). Rittel and Webber (1973) explain how certainties rooted in rationalist and positivist planning approaches are incapable of addressing the inherently complex and uncertain dimensions of planning (Allmendinger 2002; Baum 1977; Crowley and Head 2017; Hartmann 2012). In a sense, the uncertainty of planning today is conceived as a step away from the assumed certainties in historical planning thought (of the morphological kind) towards the increasing acceptance of diversity, complexity and contingency in relational planning approaches (Kurath et al. 2017; Graham and Healey 1999). Planners today accept that the built environment cannot be controlled, that the future manifestations of their work are unpredictable and that already in their early stages, planning processes are required to adapt to unforeseen changes (Rauws 2017). Accounting for contingency is an inherent dimension in planner's thinking about the future (Abram and Weszkalnys 2013b; Bertolini 2010; Christensen 1985; Salet et al. 2013).

Sociologist and planning scholar Peter Marris (1987, 159) wrote that '[p]lanning means, essentially, controlling uncertainty – either by taking action now to secure the future, or by preparing actions to be taken in case an event occurs'. Marris's suggestion is perhaps the most familiar concern with uncertainty in planning, in so far as planning activities address multiple unknowns about the future and intervene by steering change (Abbott 2005; Abram 2016; Morris and Ward 2004). Various frameworks have been developed by planning theorists through which to assess plans and how planners can respond to uncertainty in practice, knowledge and assumptions, and outcome assessment (Zandvoort et al. 2018). Christensen (1985, 63), for instance, set out to map planning problems according to four variables – knowledge, agreement, means and ends – as a matrix through which planners can match their practices to problem characteristics to 'overcome, or at least reduce, uncertainty'. She locates uncertainty within different prototype situations:

Actual problems vary in uncertainty over means and ends. If people agree on what they want and how to achieve it, then certainty prevails and planning is rational application of knowledge. If they agree on what they want but do not know how to achieve it, then planning becomes a learning process; if they do not agree on what they want but do know how to achieve alternatives, then planning becomes a bargaining process; if they agree on neither means nor ends, then planning becomes part of the search for order in chaos (ibid.).

Friend and Jessop (1969) outlined another framework in which planners face three forms of uncertainty concerning the knowledge they have about existing and future environments, different intentions among actors, and the value judgments embedded in planning interventions as they may manifest in the future. Friend

(1993, 1) later stated that planners are required to 'manage uncertainty in a strategic way', by which he means assessing what uncertainties are most significant and evaluating possible responses. Abbott (2005) integrated the two approaches to develop a single framework in which he identifies five types or 'natures' of uncertainty: chance, external uncertainty, causal uncertainty, organisational uncertainty and value uncertainty, which he maps as a range between process uncertainty and environmental uncertainty (outside the process) and advises planners to address manage each one.⁷⁶ More recently, Rauws (2017, 36) outlines a set of complex urban conditions and possible interventions on which to base an adaptive approach to uncertainty in planning to influence 'conditions under which urban areas transform'. These different approaches all classify uncertainty as a problem that requires solving, managing and organizing within linear processes. Furthermore, they show the traditionally normative approach to planning theory that considers what planners can do and should do, rather than studying what planners actually do (see Beauregard 2005; Flyvbjerg 1996; Holgersen 2015).

The findings of my study suggest that uncertainty is not a problem that planners face, nor a distinct phenomenon that can be analysed in isolation from situated practice. Rather, uncertainty is a pervasive condition within planning, a salient

⁷⁶ Another framework by Stacey (2007) later adapted by Islam and Susskind (2013), draws from Christensen's work, however they emphasise that the means versus ends dimension is too restrictive, and propose res it with a measure between how much relative consensus exists in the framing of a planning situation (see Zandvoort et al. 2018 for discussion).

dimension that frames how planners think. The planners I observed engaged with the agential properties of uncertainty within their tasks:

- In the making of the model, the uncertain project brief and ambiguous relationship with the client shaped the model and framed the planners' attention. The planners speculated how local government and the client would respond to each of their design choices, approximated time frames for feasibility reports, mapped uncertain developments around their site and conceived of ecological impacts. Synchronization kept the planners from attending to design concerns that they could not resolve at this early stage of the project due to a lack of information, helping them to systematically sort through the relevant and irrelevant, scaling their design space to what they can know, or assumptions they are willing to make.
- The ambiguous design process shaped the performative role of the drawing, temporarily unifying present-day contingencies and synchronising changes made by different stakeholders. The planners were unsure whether they would take the project to the next stage of work, and whether or not the plan would materialize and how. As they worked, estimations and predictions were altered by the client, changes in the political and economic climate caused instability in the project, and unexpected ecological risks required redesign. Planners learn to read and draw master plans as contingent artefacts, both in the continuous present time of experience and in learning events, shaping their perceptions and understandings as a community of practitioners.
- The sense of instability brought on by the past economic crisis created the report template as a source of safety for the company. As the template is pervasive in everyday work, it distributes the cognitive processes of social memory through recurrence, reinforcing reliability, standards, comparability and continuity. The planners base their operational temporal orders on past experiences of making reports through the same rhythmic mode. This ongoing look to the past reinforces the company's organizational scheme as a core and periphery structure and frames a collective memory through which the company's history is used to explain its present sociomaterial arrangements.

The planners' conceptions of uncertainty, its sources and their responses, enact cultural processes that enable them to collectively achieve shared understandings and coordination in complex tasks (see Boholm 1998, 2003; Boholm et al. 2013; Hutchins 2006). Within a distributed cognition framework, how planners address uncertainty emerges as a cultural practice, cultivated by social thought, beliefs and behaviours, and conditional to social arrangements (Hutchins 1995a, 2008; see Douglas 1986). Culture is an ongoing process of classifications through which adaptive practices are formed. The distributed cognition system is co-constitutive of cultural processes: at once an active cultural environment that can frame thinking, with embedded resources for learning, decision making and problem solving among other processes, and at once a dynamic cultural system that learns and adapts to emerging contingencies (Cole 1996; Hollan et al. 2000; Strauss and Quinn 1998).

Douglas (1966, 40) states that culture 'cannot ignore the anomalies which its scheme produces, except at risk of forfeiting confidence' (she addresses ambiguities and anomalies, both sources of uncertainty).⁷⁷ In other words, having confidence in any given system of classification is dependent upon how a culture confronts events

⁷⁷ Ambiguity - the quality of an expression to be interpreted in two or more possible ways – is a source of uncertainty, as it generates a lack of sureness and increases doubt (Camerer and Weber 1992; Duncan 1972; Kahn and Sarin 1988). For the purpose of this thesis, I use them interchangeably. As Nowotny (2015, 11) states, 'Uncertainty is often embedded in situations of ambiguity where it is difficult to disentangle what is known in principle but not in the practice of what is not (yet) known, even if practical action must be taken'.

which seem to either defy its assumptions or present anomalies to its scheme.

Drawing from Douglas's statement, I contend that the master planners, in their modes of addressing uncertainties, actively maintain confidence in their planning practices. Confidence helps in controlling the design and decision environment, generating a temporary context in which planning activities can proceed. It allows planners to attend to a finite set of choices in their designs, rather than an infinite number (see Luhmann 1989). This does not mean that planners avoid uncertainty, attempt to order it or turn it into certainty; the planners do not try to block doubt (Douglas 2001). Rather, they find ways of adapting to and attending to uncertainty as part of the entanglement through which they think. The sociomaterial arrangements of making temporarily contextualize the expectations of the project into the task, distributing and gathering responsibility, skills, memories and creativity towards generating a distributed system of confidence.

Simmel (1964 [1906]) argued that confidence provides grounds for action in addressing uncertainty about the future by rendering it apprehensible (see Barbalet 1993, 1996, 2001). Though the master planners do not assume that they will shape the world as they imagine it could or should be, their ability to materialise uncertainties and enact a future that is divisible and different from the present allows them to arrange their experiences, memories, skills and labour towards it. It is therefore not only geographic space which planners perceive as developable, but time as well, the long-term imagined in the short, and the distant in the present. If, as Appadurai (2013) argues, 'the future is a cultural fact', then in different planning

cultures of everyday practice, the future is inscribed in the present, embedded in shared collective meanings. Future uncertainties are constituted in the distributed cognitive system, enabling the master planners to collectively achieve complex tasks.

Reflections on the Method of Inquiry

As a mode of inquiry, I have found that distributed cognition offers research in planning an approach that examines and analyses its generative and dynamic social and material practices. Both theoretically and methodologically, distributed cognition foregrounds the emergent properties of a system and does not assume that elements exist *a priori*, but are made through practice. This may be available in other frameworks that follow activity, situated actions and practices, however, the emphasis on materials, and nonlinear relationships between forms of making and thinking renders distributed cognition particularly adaptive to the contingency of design practices (Harris 2004). The methodological and literature contribution of this thesis to planning scholarship and to anthropological conceptions of master planning lies within these guidelines. As Kirsh (2006, 250) observed, ‘we need better theories of how people are embedded in the world as well as better theories of how the world and the larger systems we are part of coordinate action’, which is what the literature on planning cultures and relational planning begins to do, and the distributed cognition approach expands upon.

Theorising how master planners think in teams on the basis of distributed cognition shifts the discussion on planning in three main ways. First, the focus in this thesis is on the most prevalent arrangement in which master planners work, as teams within companies. The theoretical and reflective approaches to the study of teams has been largely omitted from planning scholarship (in the literature of planning and anthropology), with the traditional focus being either on the practices and thoughts of individual planners (Çalışkan 2012; Forester 1985, 1996, 2012; Watson 2002) on the complex assemblages or networks of planning projects and places (Low 1996; Rydin 2012; Wszkalnys 2010), or on state planning mechanisms (Abram and Cowell 2004; Murdoch and Abram 2002; Rydin et al. 2002, to name a few). While contemporary literature on how planners think and act is diverse, much of it captures how planning practice is relates to the world's complexities, in multiple and often factious relationships (Abram 2011). By addressing this gap in the literature, this thesis demonstrates that embedded in the everyday coordination within teams of master planners is an internal cognitive complexity interwoven in the ecology of planning institutions.

The second shift is towards focusing on an observable unit of study, examining master planners as they engage with materials and one another in the making of things (as in Cuff 1992; Drazin 2013; Drazin and Küchler 2015; Farias and Wilkie 2016; Henderson 1991, 1999; Yaneva 2009a, 2009b). This move helps the researcher avoid a common approach of studying completed plans backwards, based on the narratives of practitioners, which cannot grasp the complexities of

practices of making master planning artefacts (Beauregard 2015). Following practice forwards, researchers can identify the sociomaterial arrangements and practices, and attend to the uncertain, ambiguous and the absent that are entangled in how planners think. The third shift entails attending to culture as it is generated in everyday practice, enacted in modes of addressing uncertainties, renders the concept amenable to planners' and planning scholars' reflexive processes. The shared meanings, cognitive frames and sociomaterial arrangements constitute planning as a discipline through the everyday practices of a professional community (Friedmann 2005). The distributed cognition approach thus supports the work of planning theorists in the cultural and relational approaches by capturing the multiple ways in which planners conceive of and enact their practices.

Within the literature on distributed cognition, the focus has been largely on coordinating groups of teams as they engage in complex technical practices and the interaction with technology. To add the dimension of planning - a complex cognitive process in itself - two analytic frameworks guided the study and elaborated on distributed cognition through a non-representational approach. The first is Rayner's (1982) study of time and space as primary ordering concepts, in which he develops a heuristic framework for the study of complex social conditions. Examining a cognitive system through four distinct perceptions – operational time, historic time, operational space and geographic space – introduces a coherent approach through which to consider sociomaterial arrangements and processes. In particular, attending to perceptions of time and space refined the analytic study of

coordination, by establishing parameters in the field. These then became the constructs through which the empirical data was analysed to explore the implicit sociomaterial arrangements and temporal and spatial perceptions within cognitive systems.

The second analytic move drew from the work of Barad (2007) on intra-actions. Her work commits to phenomena, in which intra-acting agencies are entangled and are inherently inseparable. For Barad, the practices of knowing, being and mattering cannot be divided. Intra-actions therefore do not produce independent entities, but rather 'cut together-apart', wherein '[d]iffraction is not a set pattern, but rather an iterative (re)configuring of patterns of differentiating-entangling' (Barad 2014a, 168). Reading distributed cognition tasks through diffraction allowed me to consider forms of difference, absences, and changes in entities as they emerged. The study of phenomena, as in this thesis, enacts an agential cut in itself, temporarily separating my unit of analysis from possible others to form a narrative. Furthermore, the emphasis on the study of perceptions of time and space enabled diffractive readings, as differences within and between groups of people could be understood and interrelated into a single cognitive system.

Barad's diffractive readings also helped me to reconcile the need for anonymity throughout the thesis, separating artefacts and activities from information about the project, the site, the client, the companies and the planners. As a master planner I had never thought about practice without considering the built

environment outside the studio - city, space, future users, the specifics of the project brief, urban politics, sustainability, social justice, etc. Removing these from the thesis was initially, for the planner in me, a dramatic move that narrowed the view of practice. However, through the writing process, I became able to reflect on practice and on how planners think in ways I had not anticipated, opening up an unexpected inquiry. The focus on the material and social coordination of making things in planning teams revealed forms of mattering as they emerge in distributed cognition. In my research on temporal and spatial perceptions, the dimensions of time were more easily narrated under the conditions of anonymity. The spatial dimension – the studio itself and project sites – were far more recognisable and therefore challenging to anonymise. As I edit my work and removed identifiers, the discussions on space became less substantial and I focused more on conceptual ‘design spaces’ of planning thought.

As a mode of inquiry, this thesis contributes to existing literature by elaborating an approach through which to study how planners think, what they make and how they do it. There is room for future research on the diverse types of spatial planning practices that exist, and the multiple artefacts that I did not have a chance to observe. From within this study, two questions arise that could lead to future investigations. The first question concerns the idea of task as a context of confidence, as there seems to be room for research on the significance of confidence as a social phenomenon within collaborative work practices. The literature on confidence in psychological and philosophical fields presents varied

approaches to its study and definition (Barbalet 1993; Child and Mollering 2003; Considine and Duffy 2016; Dent 2017; Peterson and Pitz 1988; Rybacz 1967; Sellsberg 1982). Often in business and management theories it is a term used to describe leadership (Sadler 1970; Sturdy et al. 2006), to the best of my knowledge it has not been explored in a distributed sense.

A second concern that this research raises for possible future consideration is the dimension of metacognition, or how planners think about their own thoughts in practice (some scholars define confidence as an individual metacognitive process, see Luttrell et al. 2013). Though planning literature includes interviews of planners, and much scholarship by planners writing on how they think, a study based on distributed cognition as it relates to an ongoing discussion and possible narration by the planners on their own thoughts, can add a new analytic perspective on planners' values and ethics in practice (Campbell 2002, 2012). This study is based on a decision to remove concerns with causality - with the study of why planners think as they do and make the plans they make - and planning literature's traditional preoccupation with what planners should do (Holgersen 2015). Adding the metacognitive dimension to further research could inform a collaborative approach with informants as a resource for reflexive thought in practice.

REFERENCES

- 6, P., & Richards, P. (2017). *Mary Douglas: Understanding Social Thought and Conflict*. Oxford: Berghahn Books.
- Abbott, J. (2005). Understanding and Managing the Unknown. *Journal of Planning Education and Research*, 24(3), 237–251.
- Abbott, M. (1985). 'The Master Plan: The Life and Death of an Idea'. PhD Thesis, Purdue University, West Lafayette, Indiana.
- Abram, S. (2011). *Culture and Planning*. Farnham, Surrey: Ashgate Publishing Limited.
- Abram, S. (2013). The future of planning? *Metropolitiques*, 2013–2015. Retrieved from <http://www.metropolitiques.eu/The-future-of-planning.html>
- Abram, S. (2014). The time it takes: Temporalities of planning. *Journal of the Royal Anthropological Institute*, 20(1), 129–147.
- Abram, S. (2016). Culture? And planning? *Planning Theory and Practice Practice*, 17(4), 654–657.
- Abram, S., & Cowell, R. (2004). Dilemmas of implementation: “integration” and “participation” in Norwegian and Scottish local government. *Environment and Planning C: Government and Policy*, 22(5), 701–719.
- Abram, S., & Cowell, R. (2004). Learning Policy: The Contextual Curtain and Conceptual Barriers. *European Planning Studies*, 12(2), 209–228.
- Abram, S., & Weszkalnys, G. (2011). Introduction: Anthropologies of planning - Temporality, imagination, and ethnography. *Focaal*, 2011(61), 3–18.
- Abram, S., & Weszkalnys, G. (2013a). An Introduction. In S. Abram & G. Weszkalnys (Eds.), *Elusive Promises: Planning in the Contemporary World* (pp. 1–34). Oxford: Berghahn Books.
- Abram, S., & Weszkalnys, G. (Eds.). (2013b). *Elusive Promises: Planning in the Contemporary World*. Oxford: Berghahn Books.
- Abu-Lughod, J. L. (1975). The legitimacy of comparisons in comparative urban studies: A theoretical position and an application to North African cities. *Urban Affairs Review*, 11, 13–35.
- Adam, B. (1990). *Time and Social Theory*. Cambridge: Polity Press.
- Adam, B. (1998). *Timescapes of Modernity: The Environment and Invisible Hazards*. Abingdon: Routledge.
- Adams, V., Murphy, M., & Clarke, A. E. (2009). Anticipation: Technoscience, life, affect, temporality. *Subjectivity*, 28(1), 246–265.
- Agar, M. (1980). *The professional stranger: an informal introduction to ethnography*. Cambridge, Mass.: Academic Press.
- Albrechts, L., & Mandelbaum, S. J. (2005). *The Network Society: A New Context for Planning?* Abingdon: Routledge.
- Alcadipani, R., & Hodgson, D. (2009). By Any Means Necessary? Ethnographic Access, Ethics and the Critical Researcher. *Tamara Journal for Critical Organization Inquiry*, 7(4), 127–146.
- Alexander, C. (1964). *Notes on the Synthesis of Form*. Cambridge, Mass: Harvard University Press.
- Alexander, E. R. (1986). *Approaches to planning: introducing current planning theories, concepts and*

- issues. New York: Gordon & Breach Science.
- Alexander, E. R. (1997). A Mile or a Millimeter? Measuring the "Planning Theory - Practice Gap." *Environment and Planning B: Urban Analytics and City Science*, 24(1), 3–6.
- Alexander, E. R. (2002). Planning rights: Toward normative criteria for evaluating plans. *International Planning Studies*, 7(3), 191–212.
- Alexander, E. R. (2015). There is no planning - only planning practices: Notes for spatial planning theories. *Planning Theory*, 1–13.
- Alfasi, N. (2017). The coding turn in urban planning: Could it remedy the essential drawbacks of planning? *Planning Theory*, 1–21.
- Allmendinger, P. (2002a). *Planning in Postmodern Times*. London: Taylor & Francis.
- Allmendinger, P. (2002b). Towards a post-positivist typology of planning theory. *Planning Theory*, 1(1), 77–99.
- Allmendinger, P. (2009). *Planning Theory*. London: Palgrave Macmillan.
- Allmendinger, P., & Haughton, G. (2009). Soft spaces, fuzzy boundaries, and metagovernance: the new spatial planning in the Thames Gateway. *Environment and Planning A*, 41, 617–633.
- Amin, A., & Thrift, N. (2002). *Cities: Reimagining the Urban*. Cambridge: Polity Press.
- Amit, V. (2003). *Constructing the Field: Ethnographic Fieldwork in the Contemporary World*. London: Taylor & Francis.
- Appadurai, A. (2013). *The Future as Cultural Fact: Essays on the Global Condition*. London: Verso Books.
- Archer, L. B. (1965). *Systematic Methods for Designers*. London: The Design Council.
- Arensberg, C. M. (1988). *The Irish Countryman: An Anthropological Study [1937]*. New York: Macmillan.
- Asimow, M. (1962). *Introduction to design*. Upper Saddle River, NJ: Prentice-Hall.
- Bailey, D. E., Leonardi, P. M., & Barley, S. R. (2012). The Lure of the Virtual. *Organization Science*, 23(5), 1485–1504.
- Balducci, A., Boelens, L., Hillier, J., Nyseth, T., & Wilkinson, C. (2011). Introduction: Strategic spatial planning in uncertainty: theory and exploratory practice. *Town Planning Review*, 82(5), 481–501.
- Banai, R., & Rapino, M. (2009). Urban theory since A Theory of Good City Form (1981) – a Progress Review. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 2(3), 259–276.
- Banerjee, T. (2011). Response to "Commentary: Is Urban Design Still Urban Planning?" *Journal of Planning Education and Research*, 31(2), 211–212.
- Barad, K. (1998). Getting Real. *Differences: A Journal of Feminist Cultural Studies*, 10(2), 87–128.
- Barad, K. (2003). Posthumanist performativity: toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society*, 28(3), 801–831.
- Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press.

- Barad, K. (2013). Ma(r)king Time: Material Entanglements and Re-memberings: Cutting Together-Apart. In P. R. Carlile, D. Nicolini, A. Langley, & T. Haridimos (Eds.), *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies* (pp. 16–31). Oxford: Oxford University Press.
- Barad, K. (2014a). Diffracting Diffraction: Cutting Together-Apart. *Parallax*, 20(3), 168–187.
- Barad, K. (2014b). Re-membering the Future, Re(con)figuring the Past—Temporality, Materiality, and Justice-to-Come. In *Feminist Theory Workshop Keynote*. Duke University. Retrieved from <https://www.artandeducation.net/classroom/video/66314/karen-barad-re-membering-the-future-re-con-figuring-the-past-temporality-materiality-and-justice-to-come>
- Barbalet, J. M. (1993). Confidence: Time and Emotion in the Sociology of Action. *Journal for the Theory of Social Behaviour*, 23(3), 229–247.
- Barbalet, J. M. (1996). Social Emotions, Confidence, Trust and Loyalty. *International Journal of Sociology and Social Policy*, 6(9/10), 75–96.
- Barbalet, J. M. (2001). *Emotion, Social Theory, and Social Structure: A Macrosociological Approach*. Cambridge: Cambridge University Press.
- Barnes, J. A. (1954). Class and Committees in a Norwegian Island Parish. *Human Relations*, 7, 39–58.
- Barriball, L. K., & While, A. (1994). Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing*, 18, 328–335.
- Bassett, E. M. (1938). *The master plan: with a discussion of the theory of community land planning legislation*. New York: Russell Sage Foundation.
- Battaglia, D. (1992). The body in the gift: Memory and forgetting in Sabarl mortuary exchange. *American Ethnologist: Journal of the American Ethnological Society*, 19(1), 3–18.
- Batty, M., & Marshall, S. (2012). The Origins of Complexity Theory in Cities and Planning. In J. Portugali, H. Meyer, E. Stolk, & E. Tan (Eds.), *Complexity Theories of Cities Have Come of Age: An Overview with Implications to Urban Planning and Design* (pp. 21–45). Berlin, Heidelberg: Springer.
- Baum, H. S. (1983). *Planners and Public Expectations*. Cambridge, Mass.: Schenkman Publishing Company.
- Baum, H. S. (1987). *The Invisible Bureaucracy: The Unconscious in Organizational Problem Solving*. New York: Oxford University Press.
- Bauman, R. (2016). Projecting Presence: Aura and Oratory in William Jennings Bryan’s Presidential Races. In E. S. Carr & M. Lempert (Eds.), *Scale: Discourse and Dimensions of Social Life* (pp. 25–51). Oakland, CA: University of California Press.
- Baxstrom, R. (2013). Even Governmentality Begins as an Image: Institutional Planning in Kuala Lumpur. In S. Abram & G. Weszkalnys (Eds.), *Elusive Promises: Planning in the Contemporary World* (Vol. 61, pp. 137–154). Oxford: Berghahn Books.
- Beauregard, R. A. (2005). Introduction: Institutional transformations. *Planning Theory*, 4, 203–207.
- Beauregard, R. A. (2012). Planning with Things. *Journal of Planning Education and Research*, 32(2), 182–190.
- Beauregard, R. A. (2015). *Planning Matter: Acting with Things*. Chicago: University of Chicago Press.
- Bechky, B. A. (2003). Sharing Meaning Across Occupational Communities: The Transformation of

- Understanding on a Production Floor. *Organization Science*, 14(3), 312–330.
- Becker, H. S. (1974). Art As Collective Action. *American Sociological Review*, 39(6), 767–776.
- Bell, C. M. (1997). *Ritual: Perspectives and Dimensions*. Oxford: Oxford University Press.
- Bellacasa, M. P. de. (2011). Matters of care in technoscience : Assembling neglected things. *Social Studies of Science*, 41(1), 85–106.
- Berger, J. (1953). Drawing is discovery. *New Statesman*. Retrieved from <http://www.newstatesman.com/culture/art-and-design/2013/05/john-berger-drawing-discovery>
- Berger, P. L., & Luckmann, T. (1966). *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Doubleday.
- Bergman, O., & Whittaker, S. (2016). *The science of managing our digital stuff*. Cambridge, Mass: MIT Press.
- Bergson, H. (1913). *Creative evolution*. London: Macmillan.
- Bergson, H. (1965). *Duration and simultaneity*. Indianapolis: Bobbs-Merrill.
- Berliner, D. C. (2005). The Abuses of Memory. *Anthropological Quarterly*, 78(1), 197–211.
- Bertolini, L. (2006). Why and how can complexity theories help spatial planners? In *AESOP Complexity Thematic Group meeting*.
- Bertolini, L. (2010). Complex systems, evolutionary planning? In E. Silva & G. De Roo (Eds.), *A Planner's Encounter with Complexity* (pp. 81–89). Aldershot: Ashgate.
- Bille, M., Hastrup, F., & Sorensen, T. F. (2010). *An Anthropology of Absence: Materializations of Transcendence and Loss*. New York: Springer.
- Blackler, F. (1995). Knowledge, Knowledge Work and Organizations: An Overview and Interpretation. *Organization Studies*, 16(6), 1021–1046.
- Blau, P. M. (1955). *The Dynamics of Bureaucracy: A Study of Interpersonal Relations in Two Government Agencies*. Chicago: University of Chicago Press.
- Bloch, M. (1977). The Past and the Present in the Present. *Man*, 12(2), 278.
- Blyton, P., & Starkey, K. (2017). *Time, Work and Organization*. Abingdon: Routledge.
- Boelens, L. (2010). Theorizing practice and practising theory: Outlines for an actor-relational-approach in planning. *Planning Theory*, 9(1), 28–62.
- Boholm, Å. (1998). Comparative Studies of Risk Perception: A Review of Twenty Years of Research. *Journal of Risk Research*, 1(2), 135–164.
- Boholm, Å. (2003). The cultural nature of risk: Can there be an anthropology of uncertainty? *Ethnos*, 68(2), 159–178.
- Boholm, Å., Henning, A., & Krzyworszeka, A. (2013). Anthropology and decision making: An introduction. *Focaal*, 2013(65).
- Bolan, R. S. (1969). Community Decision Behavior: The Culture of Planning. *Journal of the American Institute of Planners*, 35(5), 301–310.
- Booth, P. (1993). The cultural dimension in comparative research: Making sense of development

- control in France. *European Planning Studies*, 1(2), 217–229.
- Booth, P. (2011). Culture, planning and path dependence: some reflections on the problems of comparison. *Town Planning Review*, 82(1), 13–28.
- Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.
- Bourdieu, P. (1990). *The Logic of Practice*. Stanford: Stanford University Press.
- Bourdieu, P. (2003). Participant Objectivation. *Journal of the Royal Anthropological Institute*, 9(2), 281–294.
- Brannan, M. J., Pearson, G., & Worthington, F. (2007). Ethnographies of Work and the Work of Ethnography. *Ethnography*, 8(4), 395–402.
- Brewer, C. A. (2008). *Designed Maps: A Sourcebook for GIS Users*. Redlands, CA: ESRI Press.
- Broadbent, G. (1988). *Design in Architecture: Architecture and the Human Sciences*. London: Fulton.
- Brown, J. S., & Duguid, P. (2001). Knowledge and Organization: A social practice perspective. *Organization Science*, 12(2), 198–213.
- Buchanan, D., Boddy, D., & McCalman, J. (1988). Getting in, getting on, getting out, and getting back. In *Doing Research in Organizations* (pp. 53–67). London: Routledge.
- Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, 8(2), 5–21.
- Bugs, G., Granell, C., Fonts, O., Huerta, J., & Painho, M. (2010). An assessment of Public Participation GIS and Web 2.0 technologies in urban planning practice in Canela, Brazil. *Cities*, 27(3), 172–181.
- Bullivant, L. (2012). *Masterplanning Futures*. London: Taylor & Francis.
- Çalışkan, O. (2012). Design Thinking in Urbanism: Learning from the Designers. *Urban Design International*, 17, 1–25.
- Callaway, H. (1992). Ethnography and Experience: Gender Implications in Fieldwork and Texts. In J. Okely & H. Callaway (Eds.), *Anthropology and Autobiography* (pp. 29–49). London: Routledge.
- Callon, M. (1980). The State and Technical Innovation: A Case Study of the Electric Vehicle in France. *Research Policy*, 9, 358–376.
- Callon, M. (1986). The Sociology of an Actor-Network: The Case of the Electric Vehicle. In M. Callon, J. Law, & A. Rip (Eds.), *Mapping the Dynamics of Science and Technology: Sociology of Science in the real World*. London: Macmillan.
- Callon, M. (1991). Techno-Economic Networks and Irreversibility. In J. Law (Ed.), *A Sociology of Monsters: Essays on Power, Technology and Domination*. London: Routledge.
- Callon, M., & Latour, B. (1981). Unscrewing the Big Leviathan: How Actors Macro-Structure Reality and How Sociologists Help Them Do So. In K. Knorr-Cetina & A. V. Cicourel (Eds.), *Advances in Social Theory and Methodology: Toward an Integration of Micro- and Macro-Sociologies*. Boston: Routledge & Kegan Paul.
- Camerer, C., & Weber, M. (1992). Recent developments in modeling preferences: Uncertainty and ambiguity. *Journal of Risk and Uncertainty*, 5(4), 325–370.
- Campbell, H. (2002). Planning: an idea of value. *Town Planning Review*, 73(3), 271–288.
- Campbell, H. (2012). “Planning ethics” and rediscovering the idea of planning. *Planning Theory*,

11(4), 379–399.

- Carlile, P. R., Nicolini, D., Langley, A., & Tsoukas, H. (Eds.). (2013). *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies*. Oxford: Oxford University Press.
- Carmona, M. (2014). The Place-shaping Continuum: A Theory of Urban Design Process. *Journal of Urban Design*, 12(1), 2–36.
- Carmona, M., Blum, R., & Hammond, L. (2006). *Design coding in practice: an evaluation*. London: Department for Communities and Local Government.
- Carmona, M., & Giordano, V. (2012). Design Coding Diffusion of Practice in England. *Urban Design Group*. University College London. Retrieved from <http://www.udg.org.uk/sites/default/files/publications/Design-Coding-Diffusion-of-Practice-in-England.pdf>
- Carr, E. S., & Lempert, M. (Eds.). (2016). *Scale: Discourse and Dimensions of Social Life*. Oakland, California: University of California Press.
- Castells, M. (1996). *The Rise of the Network Society, The Information Age: Economy, Society and Culture, Volume 1*. Oxford: Blackwell.
- Chadwick, G. F. (1971). *A Systems View of Planning; Towards a Theory of the Urban and Regional Planning Process*. New York: Pergamon.
- Chambliss, D. (1996). *Beyond Caring: Hospitals, Nurses, and the Social Organization of Ethics*. Chicago: Chicago University Press.
- Champy, F. (2012). Review: Albena Yaneva, *The Making of a Building: A Pragmatist Approach to Architecture*. *International Sociology*, 27(5), 686–689.
- Chapman, M. (2001). Social anthropology and business studies: Some considerations of method. In D. N. Gellner & E. Hirsch (Eds.), *Inside Organizations: Anthropologists at Work* (pp. 19–33). Oxford: Berg Publishers.
- Child, J., & Möllering, G. (2003). Contextual Confidence and Active Trust Development in the Chinese Business Environment. *Organization Science*, 14(1), 69–80.
- Childe, V. G. (1950). The Urban Revolution. *The Town Planning Review*, 21(1), 3–17.
- Chrisman, N. (2001). *Configuring the users: Social division of labor in GIS software* (Paper read at Geographic Information Systems in a Changing Society, May 18-20). Columbus, Ohio. Retrieved from <http://chrisman.scg.ulaval.ca/Present/Configuring.pdf>
- Christensen, K. S. (1985). Coping with Uncertainty in Planning. *Journal of the American Planning Association*, 51(1), 63–73.
- Clark, A., & Chalmers, D. J. (1998). The Extended Mind. *Analysis*, 58(1), 7–19.
- Classen, C. (1993). *Worlds of Sense: Exploring the Senses in History and Across Cultures*. London: Routledge.
- Classen, C. (1997). Foundations for an anthropology of the senses. *International Social Science Journal*, 49(153), 401–412.
- Cole, M. (1996). *Cultural Psychology: A Once and Future Discipline*. Cambridge, Mass: Harvard University Press.
- Community guide: Masterplanning. (2014). Building and Social Housing Foundation. Retrieved from

https://www.world-habitat.org/wp-content/uploads/2016/03/Community-Guide-Masterplanning_BSHF5.pdf

- Considine, J., & Duffy, D. (2016). Keynes and the confidence faeries. *Cambridge Journal of Economics*, 40(1), 309–325.
- Cook, S. D. N., & Brown, J. S. (1999). Bridging Epistemologies: The Generative Dance Between Organizational Knowledge and Organizational Knowing. *Organization Science*, 10(4), 381–400.
- Corner, J. (1999). The Agency of Mapping: Speculation, Critique and Invention. In D. E. Cosgrove (Ed.), *Mappings* (pp. 213–233). London: Reaktion.
- Cross, N. (1993). A History of Design Methodology. In M. J. de Vries, N. Cross, & D. P. Grant (Eds.), *Design methodology and relationships with science* (pp. 15–28). Dordrecht, Germany: Kluwer Academic Publishers.
- Cross, N. (2001). Design/Science/Research: Developing a Discipline. In *5th Asian Design Conference: International Symposium on Design Science*. Seoul, Korea: Su Jeong Dang Printing Company. Retrieved from <http://web.science.mq.edu.au/~isvr/Documents/pdf files/presence-design-philosophy/DesignScienceResearch.pdf>
- Cross, N. (2011). *Design Thinking: Understanding How Designers Think and Work*. London: Bloomsbury Publishing.
- Crowley, K., & Head, B. W. (2017). The enduring challenge of “wicked problems”: revisiting Rittel and Webber. *Policy Sciences*, 50(4), 539–547.
- Cuff, D. (1992). *Architecture: The Story of Practice*. Cambridge, Mass.: MIT Press.
- Cuff, D., & Sherman, R. (2011). *Fast-Forward Urbanism: Rethinking Architecture’s Engagement with the City*. New York: Princeton Architectural Press.
- Davidoff, P. (1965). Advocacy and pluralism in planning. *Journal of the American Institute of Planners*, 31(4), 596–615.
- Davies, C. A. (1999). *Reflexive Ethnography*. London: Routledge.
- Davis, D. E. (2005). Contending Planning Cultures and the Urban Built Environment in Mexico City. In S. Bishwapriya (Ed.), *Comparative Planning Cultures* (pp. 193–222). London: Routledge.
- De Landa, M. (2006). *A New Philosophy of Society*. Continuum.
- Dear, M. J. (2000). *The Postmodern Urban Condition*. London: John Wiley & Sons.
- de Roo, P. G., Hillier, P. J., & Van Wezemael, P. J. (Eds.). (2012). *Complexity and Planning: Systems, Assemblages and Simulations*. London: Routledge.
- Delaney, D. (2010). *The spatial, the legal and the pragmatics of world-making : nomospheric investigations*. London: Routledge.
- Delaney, D., & Leitner, H. (1997). The political construction of scale. *Political Geography*, 16(2), 93–97.
- Deleuze, G. (1988). *Bergsonism*. New York: Zone.
- Deleuze, G. (1994). *Difference and repetition*. New York: Columbia University Press.
- Deleuze, G., & Guattari, F. (1988). *A Thousand Plateaus: Capitalism and Schizophrenia*. London: Continuum.

- Dent, A. S. (2017). The Devil in the Deal: Notes Toward an Anthropology of Confidence. *Anthropological Quarterly*, 90(4), 1007–1024.
- Descartes, R. (1996). *Discourse on the Method [1637]*. (D. Weissman & W. T. Bluhm, Eds.). London: Yale University Press.
- Dewey, J. (1933). *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. Boston: D.C. Heath & Co. Publishers.
- DiMaggio, P. (1997). Culture and Cognition. *Annual Review of Sociology*, 23(1), 263–287.
- Dodge, M., Kitchin, R., & Perkins, C. (2011). *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Chichester: John Wiley and Sons, Inc.
- Douglas, M. (1966). *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. London: Routledge & Kegan Paul.
- Douglas, M. (1970). *Natural Symbols: Explorations in Cosmology*. London: Routledge.
- Douglas, M. (1975). *Implicit Meanings: Essays in Anthropology*. London: Routledge & Paul.
- Douglas, M. (1978). Cultural Bias. London: Royal Anthropological Institute.
- Douglas, M. (1980). *Evans-Pritchard*. Hemel Hempstead: Harvester Press.
- Douglas, M. (1982). *In the Active Voice*. London: Routledge & Paul.
- Douglas, M. (1986). *How Institutions Think*. Syracuse, New York: Syracuse University Press.
- Douglas, M. (1991). The Idea of a Home: A Kind of Space. *Social Research*, 58(1), 287–307.
- Douglas, M. (1995). Forgotten knowledge. In M. Strathern (Ed.), *Shifting Contexts: Transformations in Anthropological Knowledge* (pp. 13–30). London: Routledge.
- Douglas, M. (2001). Dealing with Uncertainty. *Ethical Perspectives*, 8(3), 145–155.
- Douglas, M. (2006). A History of Grid-Group Cultural Theory. *Semiotics Institute Online Lecture*. Toronto, ON: University of Toronto. Retrieved from <http://projects.chass.utoronto.ca/semiotics/cyber/douglas1.pdf>
- Douglas, M., & Wildavsky, A. (1982). *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers*. Berkeley: University of California Press.
- Doumont, J. (2005). The cognitive style of PowerPoint: Slides are not all evil. *Technical Communication*, 52(1), 64–70.
- Dourish, P. (2004). *Where the Action is: The Foundations of Embodied Interaction*. Cambridge, Mass.: MIT Press.
- Dourish, P. (2017). *The stuff of bits : an essay on the materialities of information*. Cambridge, Mass.: MIT Press.
- Dourish, P., & Mazmanian, M. (2013). Media as Material: Information Representations as Material Foundations for Organizational Practice. In P. R. Carlile, D. Nicolini, A. Langley, & H. Tsoukas (Eds.), *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies* (pp. 92–118). Oxford: Oxford University Press.
- Dovey, K., & Pafka, E. (2013). The urban density assemblage: Modelling multiple measures. *Urban Design International*, 19(1), 66–76.

- Drazin, A. (2013). The Social Life of Concepts in Design Anthropology. In W. Gunn, T. Otto, & R. C. Smith (Eds.), *Design Anthropology: Theory and Practice* (pp. 33–50). London: Bloomsbury Publishing Plc.
- Drazin, A., & Küchler, S. (2015). *The Social Life of Materials: Studies in Materials and Society*. London: Bloomsbury Publishing.
- Dror, I. E., & Harnad, S. R. (2008). *Cognition Distributed: How Cognitive Technology Extends Our Minds*. Amsterdam, Netherlands: John Benjamins Publishing Company.
- Drucker, P. F. (2001). *The Ecological Vision: Reflections on the American Condition [1973]*. London: Transaction Publishers.
- Duncan, R. B. (1972). Characteristics of Organizational Environments and Perceived Environmental Uncertainty. *Administrative Science Quarterly*, 17(3), 313.
- Dupuy, G. (1991). *L'urbanisme des Réseaux: Théories et Méthodes*. Paris, France: Armand Colin.
- Durkheim, E. (1951). *Suicide: A Study in Sociology [1897]*. (G. Simpson, Ed.). New York: Simon & Schuster.
- Durkheim, E. (1964). *The Division of Labor in Society [1893]*. (W. D. Halls, Ed.). New York: Free Press.
- Durkheim, E. (1982). *Rules of Sociological Method [1895]*. (S. Lukes, Ed.). London: Simon & Schuster.
- Durkheim, E. (2012). *The Elementary Forms of the Religious Life [1912]*. London: Dover Publications.
- Durkheim, E., & Mauss, M. (1963). *Primitive Classification [1903]*. Chicago: University of Chicago Press.
- Eacott, S., & Hodges, K. (2014). The generative temporality of teaching under revision. *Critical Studies in Education*, 55(3), 289–302.
- Edwards, E., & Bhaumik, K. (Eds.). (2008). *Visual Sense: A Cultural Reader*. London: Berg.
- Ellis, C. (1996). Professional Conflict over Urban Form: The Case of Urban Freeways, 1930-1970. In M. C. Sies & C. Silver (Eds.), *Planning the Twentieth-century American City* (pp. 262–279). Baltimore: Johns Hopkins University Press.
- Engestrom, Y., Puonti, A., & Seppanen, L. (2003). Spatial and Temporal Expansion of the Object as a Challenge for Reorganizing Work. In D. Nicolini, S. Gherardi, & D. Yanow (Eds.), *Knowing in Organizations: A Practice-Based Approach* (pp. 151–186). New York: M.E. Sharpe.
- Epstein, D. G. (1973). *Brasilia, Plan and Reality: A Study of Planned and Spontaneous Settlement*. Berkeley: University of California Press.
- Etzioni, A. (1968). *The active society: a theory of societal and political processes*. New York: Free Press.
- Evans-Pritchard, E. E. (1940). *The Nuer*. Oxford: Clarendon Press.
- Evans, G. (2002). *Cultural Planning: An Urban Renaissance?* London: Taylor & Francis.
- Evans, G. W., Smith, C., & Pezdek, K. (1982). Cognitive Maps and Urban Form. *Journal of the American Planning Association*, 48(2), 232–244.
- Ewart, I. J. (2011). 'An Anthropology of Engineering'. DPhil Thesis, University of Oxford.
- Ewenstein, B., & Whyte, J. (2009). Knowledge practices in design: The role of visual representations as “epistemic objects.” *Organization Studies*, 30(1), 7–30.

- Fabian, J. (1983). *Time and the Other: How Anthropology Makes Its Object*. New York: Columbia University Press.
- Fainstein, N. I., & Fainstein, S. S. (1979). New debates in Urban Planning: The Impact of Marxist Theory within the United States. *International Journal of Urban and Regional Research*, 3(1–3), 381–403.
- Fainstein, S. S., & DeFilippis, J. (2015). *Readings in Planning Theory*. (S. Campbell & S. S. Fainstein, Eds.). Cambridge, Mass: Blackwell.
- Faludi, A. (1973). *Planning theory*. Oxford: Pergamon Press.
- Faludi, A. (2005). The Netherlands: A Culture with a Soft Spot for Planning. In B. Sanyal (Ed.), *Comparative Planning Cultures* (pp. 285–308). Abingdon: Routledge.
- Farah, J., & Teller, J. (2012). *Bricolage planning: understanding planning in a fragmented city*. Rijeka, Croatia: InTechOpen.
- Farias, I. (2015). Epistemic Dissonance: Reconfiguring Valuation in Architectural Practice. In A. B. Antal, M. Hutter, & D. Stark (Eds.), *Moments of Valuation: Exploring Sites of Dissonance* (pp. 271–289). Oxford: Oxford University Press.
- Fariás, I. (2011). Tourist Maps as Diagrams of Destination Space. *Space and Culture*, 14(4), 398–414.
- Farias, I., & Bender, T. (Eds.). (2010). *Urban Assemblages: How Actor-Network Theory Changes Urban Studies*. *Questioning cities series*. London: Routledge.
- Farias, I., & Wilkie, A. (Eds.). (2016). *Studio Studies: Operations, Topologies and Displacements*. Abingdon: Routledge.
- Ferguson, J. (2006). The Anti-politics Machine. In A. Sharma & A. Gupta (Eds.), *The Anthropology of the State: A Reader* (pp. 270–286). Oxford: Blackwell Publishing Ltd.
- Firley, E., & Groen, K. (Eds.). (2014). *The Urban Masterplanning Handbook*. Hoboken, NJ: Wiley.
- Fischler, R. (1995). Planning Theory as Culture and Experience. *Journal of Planning Education and Research*, 14(3), 173–178.
- Fischler, R. (2012). Reflective Practice. In B. Sanyal, L. J. Vale, & C. Rosan (Eds.), *Planning Ideas that Matter: Livability, Territoriality, Governance, and Reflective Practice* (pp. 313–332). Cambridge, Mass.: MIT Press.
- Fleck, L. (1981). *Genesis and Development of a Scientific Fact [1935]*. (T. J. Trenn, Ed.). Chicago: University of Chicago Press.
- Flor, N. V., & Hutchins, E. (1992). Analyzing Distributed Cognition in Software Teams: A Case Study of Collaborative Programming During Adaptive Software Maintenance. In J. Koenemann-Belliveau, T. Moher, & S. Robertson (Eds.), *Proceedings of the Fourth Annual Workshop on Empirical Studies of Programmers* (pp. 36–64). Norwood, NJ: Ablex Publishing.
- Flyvbjerg, B. (1996). The dark side of planning: Rationality and Realrationalität. In S. J. Mandelbaum, L. Mazza, & R. Burchell (Eds.), *Explorations in Planning Theory* (pp. 383–394). New Brunswick, NJ: Center for Urban Policy Research Press.
- Flyvbjerg, B. (1998). *Rationality and Power: Democracy in Practice*. Chicago: University of Chicago Press.
- Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12(2), 219–245.

- Flyvbjerg, B., & Richardson, T. (2002). Planning and Foucault: In Search of the Dark Side of Planning Theory. *Planning Futures*, 7(2), 44–63.
- Foote, K. (1990). To Remember and Forget: Archives, Memory, and Culture. *The American Archivist*, 53(3), 378–392.
- Forester, J. (1984). Bounded Rationality and the Politics of Muddling Through. *Public Administration Review*, 44(1), 23–31.
- Forester, J. (1985). Designing: Making Sense Together in Practical Conversations. *Journal of Architectural Education*, 38(3), 14–20.
- Forester, J. (1989). *Planning in the Face of Power*. Oakland: University of California Press.
- Forester, J. (1996). Learning from Practice Stories: The Priority of Practical Judgment. In S. S. Fainstein & S. Campbell (Eds.), *Readings in Planning Theory* (pp. 507–528). Hoboken, NJ: Wiley-Blackwell Publisher.
- Forester, J. (2012). Learning to improve practice: lessons from practice stories and practioners' own discourse analysis. *Planning Theory and Practice*, 13(1).
- Forester, J., Fischler, R., & Shmueli, D. (Eds.). (2012). *Israeli Planners and Designers: Profiles of Community Builders*. New York: SUNY Press.
- Forty, A. (1986). *Objects of Desire: Design and Society, 1750-1980*. London: Thames and Hudson.
- Foucault, M. (1979). *Discipline and Punish: the birth of the prison*. New York: Vintage Books.
- Foucault, M. (1980). *The History of Sexuality Vol. 1*. New York: Vintage Books.
- Foucault, M. (1984). What is Enlightenment? In P. Rabinow (Ed.), *The Foucault Reader*. New York: Pantheon.
- Fowles, S. (2010). People Without Things. In M. Bille, F. Hastrup, & T. F. Soerensen (Eds.), *An Anthropology of Absence: Materializations of Transcendence and Loss* (pp. 23–41). New York: Springer.
- Freestone, R. (2012). *Urban Planning in a Changing World : The Twentieth Century Experience*. (R. Freestone, Ed.). London: Taylor & Francis.
- Freestone, R., Thompson, S., & Williams, P. (2006). Student Experiences of Work-Based Learning in Planning Education. *Journal of Planning Education and Research*, 26(2), 237–249.
- Friedmann, J. (1967). A Conceptual Model for the Analysis of Planning Behavior. *Administrative*, 12(2), 225–252.
- Friedmann, J. (1973a). *Retracking America: A Theory of Societal Planning*. Harlow, Essex: Anchor Press.
- Friedmann, J. (1973b). The spatial organization of power in the development of urban systems. *Development and Change*, 4, 12–50.
- Friedmann, J. (1987). *Planning in the Public Domain: From Knowledge to Action*. Princeton, NJ: Princeton University Press.
- Friedmann, J. (1993). Toward a Non-Euclidian Mode of Planning. *Journal of the American Planning Association*, 59(4), 482–485.
- Friedmann, J. (2005). Globalization and the emerging culture of planning. *Progress in Planning*, 64(3), 183–234.

- Friedmann, J., & Hudson, B. (1974). Knowledge and Action: A Guide to Planning Theory. *Journal of the American Planning Association*, 40(1), 2–16.
- Friend, J. K. (1993). Planning in the presence of uncertainty: Principles and practice. *Journal of Infrastructure Planning and Management*, 476(21), 1–9.
- Friend, J. K., & Jessop, N. (1969). *Local government and strategic choice*. Oxford: Pergamon.
- Fuerst, D. (2009). Planning cultures en route to a better comprehension of planning processes? In J. Kneiling & F. Othengrafen (Eds.), *Planning cultures in Europe – decoding urban phenomena in urban and regional planning* (pp. 23–38). Farnham, Surrey: Ashgate.
- Gal, S. (2016). Scale-Making: Comparison and Perspective as Ideological Projects. In E. S. Carr & M. Lempert (Eds.), *Scale: Discourse and Dimensions of Social Life* (pp. 91–112). Oakland, CA: University of California Press.
- Garfinkel, H. (1967). *Studies in Ethnomethodology*. New Jersey: Prentice-Hall.
- Geddes, P. (1915). *Cities in Evolution: An Introduction to the Town Planning Movement and to the Study of Civics* (1949th ed.). London: Williams & Norgate.
- Gell, A. (1992). *The anthropology of time: cultural constructions of temporal maps and images*. Oxford: Berg.
- Gell, A. (1998). *Art and Agency: An Anthropological Theory*. Oxford: Clarendon Press.
- Gellner, D., & Hirsch, E. (Eds.). (2001). *Inside Organizations : Anthropologists at Work*. Oxford: Berg.
- Gibson, J. J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Oakland: University of California Press.
- Glennie, P., & Thrift, N. (1996). Reworking E.P. Thompson’s “Time, Work-discipline and Industrial Capitalism.” *Time & Society*, 5(3), 275–299.
- Goldhenson, E. (2001). Collective memory. *Natural History*, 110(1), 10.
- Goldschmidt, G. (2014). *Linkography: Unfolding the Design Process*. Cambridge, Mass.: MIT Press.
- Goodwin, C. (1994). Professional Vision. *American Anthropologist*, 96(3), 606–633.
- Goody, J. (1991). The time of telling and the telling of time in written and oral cultures. In J. Bender & D. E. Wellbery (Eds.), *Chronotypes. The Construction of Time* (pp. 77–96). Stanford, CA: Stanford University Press.
- Graham, S., & Healey, P. (1999). Relational concepts of Space and Place: Issues for Planning theory and practice. *European Planning Studies*, 7(5), 623–646.
- Grasseni, C. (Ed.). (2007). *Skilled Visions: Between Apprenticeship and Standards*. Oxford: Berghahn Books.
- Greed, C. (1994a). The place of ethnography in planning: Or is it “real research”? *Planning Practice and Research*, 9(2), 119–127.
- Greed, C. (1994b). *Women and Planning: Creating Gendered Realities*. Abingdon: Routledge.
- Grendstad, G., Selle, P., & Thompson, M. (Eds.). (2003). *Cultural Theory as Political Science*. London: Taylor & Francis.

- Grijzen, J. (2010). *Outsourcing Planning: What Do Consultants Do in a Regional Spatial Planning in the Netherlands*. Amsterdam: Amsterdam University Press.
- Gross, J. L., & Rayner, S. (1985). *Measuring Culture: A Paradigm for the Analysis of Social Organization*. New York: Columbia University Press.
- Groth, C. (2016). Design and Craft Thinking Analysed as Embodied Cognition. *FORM Akademisk*, 9(1), 1–21.
- Guggenheim, M. (2009). Building memory: Architecture, networks and users. *Memory Studies*, 2(1), 39–53.
- Gunder, M. (2010). Planning as the ideology of (neoliberal) space. *Planning Theory*, 9(4), 298–314.
- Gunder, M. (2011). Commentary: Is Urban Design Still Urban Planning? An Exploration and Response. *Journal of Planning Education and Research*, 31(2), 184–195.
- Gunder, M., & Hillier, J. (2004). Conforming to the Expectations of the Profession: A Lacanian Perspective on Planning Practice, Norms and Values. *Planning Theory and Practice*, 5(2), 217–235.
- Gurvitch, G. (1964). *The Spectrum of Social Time*. Dordrecht: Reidel.
- Guyer, J. I. (2007). Prophecy and the near future: Thoughts on macroeconomic, evangelical, and punctuated time. *American Ethnologist*, 34(3), 409–421.
- Habermas, J. (1979). *Communication and the Evolution of Society*. London: Heinemann.
- Habermas, J. (1983). *The Theory of Communicative Action, vol. 1*. Cambridge, Mass: MIT Press.
- Habermas, J. (1990). *Moral Consciousness and Communicative Action*. Cambridge, Mass: MIT Press.
- Hage, G. (2005). A not so multi-sited ethnography of a not so imagined community. *Anthropological Theory*, 5(4), 463–75.
- Hague, C. (2000). What is Planning and What Do Planners Do? In P. Allmendinger, A. Prior, & J. Raemaekers (Eds.), *Introduction to Planning Practice* (pp. 1–20). Chichester: John Wiley and Sons, Inc.
- Haider, J., & Sundin, O. (2010). Beyond the legacy of the Enlightenment? Online encyclopaedias as digital heterotopias. *First Monday: Peer-Reviewed Journal on the Internet*, 15(1). Retrieved from <http://firstmonday.org/article/view/2744/2428>
- Hajer, M. A. (1995). *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford: Clarendon Press.
- Hajer, M., & Laws, D. (2009). Ordering through Discourse. In R. E. Goodin, M. Moran, & M. Rein (Eds.), *The Oxford Handbook of Public Policy* (pp. 251–268). Oxford: Oxford University Press.
- Halbwachs, M. (1992). *On Collective Memory [ca.1947-1950]*. (L. A. Coser, Ed.). Chicago: University of Chicago Press.
- Halbwachs, M. (1994). *Les cadres sociaux de la mémoire [1925]*. (M. Albin, Ed.). Paris: Gérard Namer.
- Hall, A. D. (1962). *A Methodology for Systems Engineering*. Princeton, N.J.: Van Nostrand.
- Hall, P. (1983). The Anglo-American connection: rival rationalities in planning theory and practice, 1955-1980. *Environment and Planning B: Planning and Design*, 10, 41–6.
- Hall, P. (1992). *Urban and Regional Planning*. London: Routledge.

- Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in Practice*. Abingdon: Routledge.
- Haraway, D. (1992). Promises of Monsters: A Regenerative Politics for Inappropriate/d Others. In L. Grossberg, C. Nelson, & P. Treichler (Eds.), *Cultural Studies* (pp. 295–337). London: Routledge.
- Harnad, S. (2005). Distributed Processes, Distributed Cognizers and Collaborative Cognition. *Pragmatics & Cognition*, 13(3), 501–514.
- Harper, R. (1997). *Inside the IMF: An Ethnography of Documents, Technology, and Organizational Action*. London: Taylor & Francis.
- Harris, S. (2004). Distributed Cognition. Retrieved from http://mcs.open.ac.uk/yr258/dist_cog/
- Hart, D. A. (1976). Planning as an Iterative Process. *Local Government Studies*, 2(3), 27–42.
- Hartmann, T. (2010). Reframing Poly-rational Floodplains: Land Policy for Large Areas for Temporary Emergency Retention. *Nature and Culture*, 5(1), 15–30.
- Hartmann, T. (2012). Wicked problems and clumsy solutions: Planning as expectation management. *Planning Theory*, 11(3), 242–256.
- Harvey, D. (1978). The urban process under capitalism: a framework for analysis. *International Journal of Urban and Regional Research* 1, 2(1–3), 101–131.
- Harvey, D. (1990). Between Space and Time: Reflections on the Geographical Imagination. *Annals of the Association of American Geographers*, 80(3), 418–434.
- Harvey, D. (2005). The sociological and geographical imaginations. *International Journal of Politics, Culture and Society*, 18(3–4), 211–255.
- Harvey, P. (2009). Between narrative and number: The case of ARUP's 3D digital city model. *Cultural Sociology*, 3(2), 257–276.
- Hastrup, K. (1993). The native voice - and the anthropological vision. *Social Anthropology*, 1(2), 173–186.
- Hazlehurst, B., McMullen, C. K., & Gorman, P. N. (2007). Distributed Cognition in the Heart Room: How situation awareness arises from coordinated communications during cardiac surgery. *Journal of Biomedical Informatics*, 40(5), 539–551.
- Healey, P. (1983). *Local Plans in British Land Use Planning*. Oxford: Pergamon Press.
- Healey, P. (1992). Planning through debate: The communicative turn in planning theory. *Town Planning Review*, 63(2), 143–162.
- Healey, P. (1997). *Collaborative Planning: Shaping Places in a Fragmented Society*. New York: Macmillan.
- Healey, P. (2006). Relational complexity and the imaginative power of strategic spatial planning. *European Planning Studies*, 14(4), 525–546.
- Healey, P. (2007). *Urban Complexity And Spatial Strategies: Towards a Relational Planning for Our Times*. Abingdon: Routledge.
- Heidegger, M. (1996). *Being and time: A translation of Sein und Zeit [1927]*. (J. Stambaugh, Ed.). Albany, NY: SUNY Press.
- Henderson, K. (1991). Flexible Sketches and Inflexible Databases: Visual communication, conscription devices and boundary objects in engineering design practice. *Science, Technology & Human Values*, 16(4), 448–473.

- Henderson, K. (1999). *On Line and on Paper: Visual Representations, Visual Culture, and Computer Graphics in Design Engineering*. Cambridge, Mass.: Mit Press.
- Hendon, J. A. (2000). Having and Holding: Storage, Memory, Knowledge, and Social Relations. *American Anthropologist*, 102(1), 42–53.
- Hennion, A. (1989). An Intermediary Between Production and Consumption: The Producer of Popular Music. *Science, Technology, & Human Values*, 14(4), 400–424.
- Hennion, A., & Farías, I. (2016). For a sociology of maquettes: An interview with Antoine Hennion. In I. Farías & A. Wilkie (Eds.), *Studio Studies: Operations, Topologies and Displacements* (pp. 73–88). Abingdon: Routledge.
- Herzfeld, M. (1991). *A Place in History: Social and Monumental Time in a Cretan Town*. Princeton, NJ: Princeton University Press.
- Hess, D. J. (2001). Ethnography and the Development of Science and Technology Studies. In P. Atkinson, A. Coffey, S. Delamont, J. Lofland, & L. Lofland (Eds.), *Sage Handbook of Ethnography* (pp. 234–245). Thousand Oaks, CA: Sage Publications.
- Heuts, F., & Mol, A. (2013). What Is a Good Tomato? A Case of Valuing in Practice. *Valuation Studies*, 1(2), 125–146.
- Hightower, H. C. (1969). Planning Theory in Contemporary Professional Education. *Journal of the American Institute of Planners*, 35(5), 326–329.
- Hoch, C. (1994). *What Planners Do: Power, Politics and Persuasion*. Washington DC, USA: Planners Press, American Planning Association.
- Hoch, C. (2007). Making plans: Representation and intention. *Planning Theory*, 6(1), 15–35.
- Hoch, C. (2012). Chapter 13: Making Plans. In R. Weber & R. Crane (Eds.), *Urban Planning Handbook* (pp. 241–258). New York: Oxford Press.
- Hoch, C. (2016). Utopia, scenario and plan: A pragmatic integration. *Planning Theory*, 15(1), 6–22.
- Hoch, C., & Cibulskis, A. (1987). Planning Threatened: A Preliminary Report of Planners and Political Conflict. *Journal of Planning Education and Research*, 6(2), 99–107.
- Hodges, M. (2008). Rethinking time's arrow: Bergson, Deleuze and the anthropology of time. *Anthropological Theory*, 8(4), 399–429.
- Holgersen, S. (2015). Spatial planning as condensation of social relations: A dialectical approach. *Planning Theory*, 14(1), 5–22.
- Hollan, J. D., Hutchins, E., & Kirsh, D. (2000). Distributed cognition: toward a new foundation for human-computer interaction research. *ACM Transactions on Computer-Human Interaction*, 7(2), 174–196.
- Holston, J. (1989). *The Modernist City: An Anthropological Critique of Brasilia*. Berkeley, CA: University of California Press.
- Holston, J., & Appadurai, A. (1996). Cities and Citizenship. *Public Culture*, 8(2), 187–204.
- Hommels, A. (2005). Studying Obduracy in the City: Toward a Productive Fusion between Technology Studies and Urban Studies. *Science, Technology & Human Values*, 30(3), 323–351.
- Howe, E. (1990). Normative Ethics in Planning. *Journal of Planning Literature*, 5(2), 123–150.
- Howe, J., & Langdon, C. (2002). Towards a Reflexive Planning Theory. *Planning Theory*, 1(3), 209–

- Howitt, R. (1998). Scale as relation: Musical metaphors of geographical scale. *Area*, 30(1), 49–58.
- Howitt, R. (2003). Scale. In J. Agnew., K. Mitchell, & G. Toal (Eds.), *A Companion to Political Geography* (pp. 138–157). Oxford: Blackwell.
- Hudson, B. M. (1979). Comparison of current planning theories: counterparts and contradictions. *Journal of Americal Planning Association*, 45, 387–98.
- Hughes, D.O. & Trautmann, T.R. (Eds.)(1995). *Time: Histories and Ethnologies*. Ann Arbor: The University of Michigan Press.
- Husserl, E. (1989). The Origin of Geometry [1936]. In J. Derrida (Ed.), *Edmund Husserl's origin of geometry: An introduction* (pp. 157–180). Lincoln, NE: University of Nebraska Press.
- Hutchins, E. (1995a). *Cognition in the Wild*. Cambridge, Mass: MIT Press.
- Hutchins, E. (1995b). How a cockpit remembers its speeds. *Cognitive Science*, 19(3), 265–288.
- Hutchins, E. (2006). The distributed cognition perspective on human interaction. In E. N. Levinson (Ed.), *Roots of human sociality: culture, cognition and interaction* (pp. 375–398). Oxford: Berg Publishers.
- Hutchins, E. (2008). The role of cultural practices in the emergence of modern human intelligence. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 363(1499), 2011–2019.
- Hutchins, E. (2010a). Choosing units of analysis for cognition. *Topics in Cognitive Science*, 2(4), 705–715.
- Hutchins, E. (2010b). Enaction, Imagination and Insight. In J. Stewart, O. Gapenne, & E. A. Di Paolo (Eds.), *Enaction: Toward a New Paradigm for Cognitive Science* (pp. 425–450). Cambridge, Mass.: MIT Press.
- Hutchins, E., & Klausen, T. (1996). Distributed Cognition in an Airline Cockpit. In Y. Engstrom & D. Middleton (Eds.), *Cognition and Communication at Work* (pp. 15–34). Cambridge: Cambridge University Press.
- Huxley, M. M., & Yiftachel, O. (2000). New Paradigm or Old Myopia? Unsettling the Communicative Turn in Planning Theory. *Journal of Planning Education and Research*, 19(4), 333–342.
- Ingold, T. (1993). The Temporality of the Landscape. *World Archaeology*, 25(2), 152–174.
- Ingold, T. (2000). *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. Abingdon: Routledge.
- Ingold, T. (2005). The eye of the storm: visual perception and the weather. *Visual Studies*, 20(2), 97–104.
- Ingold, T. (2006). Rethinking the Animate, Re-Animating Thought. *Ethnos: Journal of Anthropology*, 71(1), 9–20.
- Ingold, T. (2007). Materials against materiality. *Archaeological Dialogues*, 14(1), 1–16.
- Ingold, T. (2010a). *Bringing Things to Life: Creative Entanglements in a World of Materials* (ESRC National Centre for Research Methods, NCRM Working Paper Series No. 15). Retrieved from <http://www.socialsciences.manchester.ac.uk/realities/publications/workingpapers/15-2010-07-realities-bringing-things-to-life.pdf>
- Ingold, T. (2010b). The textility of making. *Cambridge Journal of Economics*, 34, 91–102.

- Ingold, T. (2013a). *Making: Anthropology, Archaeology, Art and Architecture*. London: Taylor & Francis.
- Ingold, T. (2013b). *Redrawing Anthropology: Materials, Movements, Lines*. Farnham: Ashgate Publishing Ltd.
- Ingold, T. (2015). Foreword. In *Non-Representational Methodologies: Re-Envisioning Research* (pp. vii–x). Abingdon: Routledge.
- Innes, J. (1995). Planning Theory's Emerging Paradigm: Communicative Action an Interactive Practice. *Journal of Planning Education & Research*, 14(3), 183–189.
- Islam, S., & Sussking, L. (2013). *Water Diplomacy: A Negotiated Approach to Managing Complex Water Networks*. London: Routledge.
- Jackson, A. (1987). *Anthropology at Home*. London: Tavistock Publications.
- Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Vintage Books.
- Jacobs, J. M. (2012). Urban geographies I: Still thinking cities relationally. *Progress in Human Geography*, 36(3), 412–422.
- Jansen, R. S. (2007). Resurrection and Appropriation: Reputational Trajectories, Memory Work, and the Political Use of Historical Figures. *American Journal of Sociology*, 112(4), 953–1007.
- Jasanoff, S., & Kim, S. H. (2015). *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press.
- Jones, J. C. (1970). *Design Methods: Seeds of Human Futures*. New York: Wiley-Interscience.
- Jones, J. C. (1992). *Design Methods*. New York: Wiley.
- Joyce, R. A. (2000). Heirlooms and houses: materiality and social memory. In R. A. Joyce & S. D. Gillespie (Eds.), *Beyond Kinship: Social and Material Reproduction in House Societies* (pp. 189–212). Philadelphia: University of Pennsylvania Press.
- Kahn, B. E., & Sarin, R. K. (1988). Modeling Ambiguity in Decisions Under Uncertainty. *Journal of Consumer Research*, 15(2), 265–272.
- Kallinikos, J., Aaltonen, A., & Marton, A. (2010). A theory of digital objects. *First Monday: Peer-Reviewed Journal on the Internet*, 15(6). Retrieved from <http://firstmonday.org/ojs/index.php/fm/article/view/3033/2564>
- Kant, I. (1999). *Critique of Pure Reason [1781]*. (P. Guyer & A. W. Wood, Eds.). Cambridge: Cambridge University Press.
- Kaplan, S. (2011). Strategy and PowerPoint: An Inquiry into the Epistemic Culture and Machinery of Strategy Making. *Organization Science*, 22(2), 320–346.
- Keller, D. A., Koch, M., & Selle, K. (1996). "Either/or" and "and": First Impressions of a Journey into the Planning Cultures of Four Countries. *Planning Perspectives*, 11, 41–54.
- Khakee, A. (2000). Reading plans as an exercise in evaluation. *Evaluation*, 6(2), 119–136.
- Kidd, A. (1994). The Marks Are on the Knowledge Workers. In *SIGCHI Conference on Human Factors in Computing Systems: Celebrating Interdependence* (pp. 186–191). New York: ACM Press.
- Kim, A. M. (2012). The Evolution of The Institutional Approach in Planning. In R. Weber & R. Crane (Eds.), *The Oxford Handbook of Urban Planning* (pp. 69–86). Oxford: Oxford University Press.

- Kirsh, D. (1995). The intelligent use of space. *Artificial Intelligence*, 73(1–2), 31–68.
- Kirsh, D. (2006). Distributed Cognition: A methodological note. *Pragmatics & Cognition*, 14(2), 249–262.
- Kitchin, R., & Dodge, M. (2011). Rethinking Maps. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Chichester: John Wiley & Sons, Inc.
- Knieling, J., & Othengrafen, F. (Eds.). (2009). *Planning Cultures in Europe: Decoding Cultural Phenomena in Urban and Regional Planning*. Farnham, Surrey: Ashgate Publishing Ltd.
- Knoblauch, H. (2013). *PowerPoint, Communication, and the Knowledge Society*. Cambridge: Cambridge University Press.
- Knorr-Cetina, K. (1995). Laboratory Studies: The Cultural Approach to the Study of Science. In S. Jasanoff, G. E. Markle, J. C. Petersen, & T. Pinch (Eds.), *Handbook of Science and Technology Studies* (pp. 140–166). Los Angeles: Sage Publications.
- Knorr-Cetina, K. (1997). Sociality with Objects: Social Relations in Postsocial Knowledge Societies. *Theory, Culture & Society*, 14(4), 1–30.
- Knorr-Cetina, K. (1999). *Epistemic Cultures: How the Sciences Make Knowledge*. Cambridge, Mass.: Harvard University Press.
- Knorr, K. (1977). Producing and reproducing knowledge: Descriptive or constructive? Toward a model of research production. *Social Science Information*, 16(6), 669–696.
- Krause-Jensen, J. (2010). *Flexible Firm: The Design of Culture at Bang & Olufsen*. New York: Berghahn Books, Inc.
- Krieger, A. (2000). The planner as urban designer: reforming planning education in the new millennium. In L. Rodwin & B. Sanyal (Eds.), *The Profession of City Planning: Changes, Successes, Failures and Challenges 1950-2000* (pp. 207–209). Rutgers, NJ: Center for Urban Policy Research.
- Krippendorff, K. (2006). *The semantic turn: A new foundation for design*. Boca Raton: CRC Press.
- Kronenfeld, D. B. (1996). *Plastic Glasses and Church Fathers: Semantic Extension From the Ethnoscience Tradition*. Oxford: Oxford University Press.
- Krueckeberg, D. A. (1983a). *Introduction to planning history in the United States*. New York: Center for Urban Policy Research.
- Krueckeberg, D. A. (1983b). *The American Planner: Biographies and Recollections*. London: Methuen.
- Krueckeberg, D. A. (1993). Between Self and Culture or What Are Biographies of Planners About? *Journal of the American Planning Association*, 59(2), 217.
- Krumholz, N., & Forester, J. (1990). *Making Equity Planning Work: Leadership in the Public Sector*. Philadelphia, PA: Temple University Press.
- Küchler, S. (1999). The place of memory. In A. Forty & S. Küchler (Eds.), *The Art of Forgetting* (pp. 53–72). Oxford: Berg.
- Kudva, N. (2008). Teaching Planning, Constructing Theory. *Planning Theory & Practice*, 9(3), 363–376.
- Kunda, G. (1992). *Engineering Culture: Control and Commitment in a High-Technology Firm*.

- Philadelphia: Temple University Press.
- Kuper, H. (1972). The Language of Sites in the Politics of Space. *American Anthropologist, New Series*, 74(3), 411–425.
- Kurath, M., Marskamp, M., Paulos, J., & Ruegg, J. (2017). *Relational Planning: Tracing Artefacts, Agency and Practices*. New York: Springer International Publishing.
- Lane, M. B. (2005). Public Participation in Planning: an intellectual history. *Australian Geographer*, 36(3), 283–299.
- Larsson, G. (2006). *Spatial Planning Systems in Western Europe: An Overview*. Amsterdam, Netherlands: IOS Press.
- Latour, B. (1986a). The Powers of Association. In J. Law (Ed.), *Power, Action and Belief: A New Sociology of Knowledge* (pp. 264–280). London: Routledge & Kegan Paul.
- Latour, B. (1986b). Visualisation and cognition: Drawing things together. *Knowledge and Society: Studies in the Sociology of Culture Past and Present*, 6, 1–40.
- Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge, Mass.: Harvard University Press.
- Latour, B. (1988). *The Pasteurization of France*. Cambridge, Mass: Harvard University Press.
- Latour, B. (1991). Technology is society made durable. *The Sociological Review*, 38(1), 103–131.
- Latour, B. (1995). Cogito ergo sumus! or psychology swept inside out by the fresh air of the upper deck...: A review of Ed Hutchins "Cognition in the Wild." *Mind, Culture, and Activity: An International Journal*, 3(1), 54–63.
- Latour, B. (1996). On actor-network theory: A few clarifications. *Soziale Welt*, 47(4), 369–381.
- Latour, B. (1999). *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, Mass.: Harvard University Press.
- Latour, B. (2000). When things strike back: a possible contribution of "science studies" to the social sciences. *The British Journal of Sociology*, 51(1), 107–123.
- Latour, B. (2004). Why has critique run out of steam? From matters of fact to matters of concern. *Critical Inquiry*, 30, 225–248.
- Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Latour, B. (2013). *An Inquiry Into Modes of Existence*. Cambridge, Mass.: Harvard University Press.
- Latour, B., & Woolgar, S. (1979). *Laboratory Life: The Construction of Scientific Facts*. New Jersey: Princeton University Press.
- Lauer, R. H. (1980). *Temporal Man*. New York: Praeger.
- Lave, J. (1988). *Cognition in Practice: Mind, Mathematics and Culture in Everyday Life*. Cambridge: Cambridge University Press.
- Law, J., & Mol, A. (1995). Notes on materiality and sociality. *The Sociological Review*, 43(2), 274–294.
- Law, J., & Mol, A. (Eds.). (2002). *Complexities: Social Studies of Knowledge Practices*. Durham, NC: Duke University Press.

- Law, J., & Moser, I. (2012). Contexts and Culling. *Science, Technology, & Human Values*, 37(4), 332–354.
- Lawrence, D. L., & Low, S. M. (1990). The Built Environment and Spatial Form. *Annual Review of Anthropology*, 19, 453–505.
- Lawson, B. (1980). *How Designers Think: The Design Process Demystified* (3rd ed.). Oxford: Architectural Press.
- Lawson, B., & Dorst, K. (2009). *Design Expertise*. Oxford: Architectural Press.
- Le Breton, D. (2017). *Sensing the World : An Anthropology of the Senses*. (C. Ruschensky, Ed.). London: Bloomsbury.
- Leach, E. (1961). *Rethinking Anthropology*. London: The Athlone Press, University of London.
- Leaf, M. (2005). Modernity Confronts Tradition: The Professional Planner and Local Corporatism in the Rebuilding of China's Cities. In B. Sanyal (Ed.), *Comparative Planning Cultures* (pp. 91–112). Abingdon: Routledge.
- Lefebvre, H. (1974). *The Production of Space*. Oxford: Blackwell.
- Lévi-Strauss, C. (1966). *The Savage Mind*. London: Weidenfeld & Nicolson.
- Levin, P. H. (1966). Decision-making in urban design. In N. Cross (Ed.), *Developments in Design Methodology* (1984th ed.). Chichester: John Wiley & Sons, Inc.
- Lewin, K. (1951). *Field Theory in Social Sciences*. New York: Harper and Row.
- Lewis, J. D., & Weigart, A. J. (1981). The structures and meanings of social time. *Social Forces*, 60, 432–62.
- Lewis, P., Tsurumaki, M., & Lewis, D. J. (2016). *Manual of Section*. Princeton, N.J.: Princeton Architectural Press.
- Li, T. M. (2005). Beyond “the State” and Failed Schemes. *American Anthropologist*, 107(3), 383–394.
- Lien, M. E., & Law, J. (2011). “Emergent Aliens”: On Salmon, Nature, and Their Enactment. *Ethnos*, 76(1), 65–87.
- Lieto, L., & Beauregard, R. A. (Eds.). (2016). *Planning for a Material World*. London: Routledge.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. London: Sage Publications.
- Lindblom, C. E. (1959). The science of “muddling through.” *Public Administration Review*, 19, 78–88.
- Lindblom, C. E. (1979). Still muddling, not yet through. *Public Administration Review*, 39, 517–26.
- Litzynger, R. A. (1998). Memory Work: Reconstituting the Ethnic in Post-Mao China. *Cultural Anthropology*, 13(2), 224–255.
- Low, S. M. (1996a). Spatializing Culture: The social production and social construction of public space in Costa Rica. *American Ethnologist*, 23(4), 861–879.
- Low, S. M. (1996b). The Anthropology of Cities: Imagining and Theorizing the City. *Annual Review of Anthropology*, 25(1), 383–409.
- Low, S. M., & Lawrence-Zúñiga, D. (2003). *Anthropology of Space and Place: Locating Culture*. Hoboken, NJ: Wiley.
- Luhmann, N. (1989). *Ecological Communication*. Chicago: University of Chicago Press.

- Luttrell, A., Briñol, P., Petty, R. E., Cunningham, W., & Díaz, D. (2013). Metacognitive confidence: A neuroscience approach. *Revista de Psicología Social*, 28(3), 317–332.
- Lynch, K. (1984). *Good City Form*. Cambridge, Mass.: MIT Press.
- Maantay, J., & Ziegler, J. (2006). *GIS for the Urban Environment*. New York: ESRI Press.
- Mackay, H., Carne, C., Beynon-Davies, P., & Tudhope, D. (2000). Reconfiguring the User: Using Rapid Application Development filing cabinet. *Social Studies of Science*, 3-, 737–757.
- Malafouris, L. (2004a). At the potter's wheel: an argument for material agency. In C. Knappett & L. Malafouris (Eds.), *Material Agency: Towards a Non-anthropocentric Perspective* (pp. 19–36). New York: Springer.
- Malafouris, L. (2004b). The cognitive basis of material engagement: where brain, body and culture conflate. In C. Gosden, C. Renfrew, & E. DeMarrais (Eds.), *Rethinking Materiality: The Engagement of Mind with the Material World* (pp. 53–62). Cambridge: McDonald Institute for Archaeological Research.
- Malafouris, L. (2013). How Things Shape the Mind: A Theory of Material Engagement. *Minds and Machines*, 25(1), 111–113.
- Malafouris, L., & Renfrew, C. (2010). *The Cognitive Life of Things: Recasting the Boundaries of the Mind*. Cambridge: McDonald Institute for Archaeological Research.
- Malinowski, B. (1922). *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea* (1978th ed.). Abingdon: Routledge.
- Mandelbaum, S. J. (1990). Reading plans. *Journal of the American Planning Association*, 56(3), 350–358.
- Manovich, L. (2001). *The language of new media*. Cambridge, Mass: MIT Press.
- March, J. G., & Simon, H. A. (1958). *Organizations*. New York: J. Wiley and Sons.
- Marchand, T. H. J. (2001). *Minaret Building and Apprenticeship in Yemen*. Richmond, Surrey: Curzon Press.
- Marchand, T. H. J. (2009). *The Masons of Djenné*. Bloomington, IN: Indiana University Press.
- Marcus, G. E., & Fischer, M. M. J. (1986). *Anthropology as Cultural Critique: An Experimental Moment in the Human Sciences*. Chicago: University of Chicago Press.
- Marcus, R. (2005, August 30). PowerPoint: Killer App? *The Washington Post*.
- Markus, T. A. (1969). The role of building performance measurement and appraisal in design method. In G. Broadbent & A. Ward (Eds.), *Design Methods in Architecture*. London: Lund Humphries.
- Marris, P. (1987). *Meaning and Action: Community Planning and Conceptions of Change*. Abingdon: Routledge & Kegan Paul.
- Marshall, S. (2012). *Urban Coding and Planning*. London: Taylor & Francis.
- Marston, S. (2000). The Social Construction of Scale. *Progress in Human Geography*, 24(2), 219–242.
- Marx, K. (1976). *Capital, Volume I [1867]*. New York: Vintage Books.
- Massey, D. (1992). Politics and space/time. *New Left Review*, 196, 65–84.

- Massey, D. (Ed.). (1999). *Human Geography Today*. Cambridge, UK: Polity Press.
- Matthews, P., & Satsangi, M. (2007). Planners, developers and power: A critical discourse analysis of the redevelopment of Leith Docks, Scotland. *Planning Practice and Research*, 22(4), 495–511.
- Mauss, M., & Beuchat, H. (1979). *Seasonal Variations of the Eskimo: A Study in Social Morphology [1906]*. London: Routledge.
- Mauss, M., & Hubert, H. (1909). *Melanges d'Histoire des Religions*. Paris: Alcan.
- Maver, T. W. (1970). Appraisal in the building design process, emerging methods. In G. Moore (Ed.), *Environmental Design and Planning*. Cambridge, Mass: MIT Press.
- Maynard, P. (2005). *Drawing distinctions : The varieties of graphic expression*. Ithaca, NY: Cornell University Press.
- McFarlane, C. (2016). The geographies of urban density: Topology, politics and the city. *Progress in Human Geography*, 40(5), 629–648.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Metzger, J., Soneryd, L., Hallström, K. T., & Tamm Hallström, K. (2017). “Power” is that which remains to be explained: Dispelling the ominous dark matter of critical planning studies. *Planning Theory*, 16(2), 203–222.
- Meyer, M. (2012). Placing and tracing absence: A material culture of the immaterial. *Journal of Material Culture*, 17(1), 103–110.
- Meyer, W. B. (2013). *The Environmental Advantages of Cities: Countering Commonsense Antiurbanism*. Cambridge, Mass.: MIT Press.
- Michaelian, K., & Sutton, J. (2013). Distributed Cognition and Memory Research: History and Current Directions. *Review of Philosophy and Psychology*, 4(1), 1–24.
- Miller, D. (1998). *Material Cultures: Why Some Things Matter*. Abingdon: Routledge.
- Miller, D. (2005). Materiality: An Introduction. In D. Miller (Ed.), *Materiality* (pp. 1–50). Durham and London: Duke University Press.
- Miller, D. (2010). *Stuff*. Hoboken, NJ: Wiley.
- Mills, B. J., & Walker, W. H. (Eds.). (2008). *Memory Work: Archaeologies of Material Practices*. Oakland: University of California Press.
- Minnery, J. (2007). Stars and their supporting cast: State, market and community as actors in urban governance. *Urban Policy and Research*, 25(3), 325–345.
- Minsky, M. (1985). *Society of Mind*. New York: Simon & Schuster.
- Minton, A. (2012). *Ground Control: Fear and happiness in the twenty-first-century city*. London: Penguin Books Limited.
- Misztal, B. A. (2003). Durkheim on Collective Memory. *Journal of Classical Sociology*, 3(2), 123–143.
- Miyazaki, H. (2006). Documenting the Present. In A. Riles (Ed.), *Documents: Artifacts of Modern Knowledge* (pp. 206–226). Michigan: University of Michigan Press.
- Mol, A. (2003). *The Body Multiple: Ontology in Medical Practice*. Durham: Duke University Press.

- Mol, A. (2014). A reader's guide to the "ontological turn". Retrieved from: <https://doi.org/10.1111/j.1548-1360.2010.01061.x/abstract>.
- Moroni, S. (2015). Complexity and the inherent limits of explanation and prediction: Urban codes for self-organising cities. *Planning Theory*, 14(3), 248–267.
- Moroni, S., & Lorini, G. (2016). Graphic rules in planning: A critical exploration of normative drawings starting from zoning maps and form-based codes. *Planning Theory*, 1–22.
- Morris, R., & Ward, G. (2004). *The Cognitive Psychology of Planning*. London: Taylor & Francis.
- Mukerji, C. (2009). *Impossible Engineering: Technology and Territoriality on the Canal Du Midi*. Princeton, NJ: Princeton University Press.
- Mukerji, C. (2015). The Material Turn. In *Emerging Trends in the Social and Behavioral Sciences* (pp. 1–13). Hoboken, NJ: John Wiley & Sons, Inc.
- Müller, M., & Schurr, C. (2016). Assemblage thinking and actor-network theory: conjunctions, disjunctions, cross-fertilisations. *Transactions of the Institute of British Geographers*, 41(3), 217–229.
- Mumford, L. (1996). What is a City? [1937]. In R. T. LeGates & F. Stout (Eds.), *The City Reader* (pp. 91–95). London: Routledge.
- Munn, N. (1983). Gawan Kula: spatiotemporal control and the symbolism of influence. In J. Leach & E. Leach (Eds.), *New perspectives on the kula* (pp. 277–308). Cambridge: Cambridge University Press.
- Munn, N. (1986). *The fame of Gawa*. Chicago: Chicago University Press.
- Munn, N. (1990). Constructing Regional Worlds in Experience: Kula Exchange, Witchcraft and Gawan Local Events. *Man: The Journal of the Royal Anthropological Institute*, 25(1), 1–17.
- Munn, N. (1992). The Cultural Anthropology of Time: A Critical Essay. *Annual Review of Anthropology*, 21, 93–123.
- Munn, N. (2013). The "becoming-past" of places: Spacetime and memory in nineteenth-century, pre-Civil War New York. *HAU: Journal of Ethnographic Theory*, 3(2), 359–380.
- Murdoch, J., & Abram, S. (2002). *Rationalities of Planning: Development Versus Environment in Planning for Housing*. Farnham, Surrey: Ashgate.
- Murray, J. H. (2012). *Inventing the Medium: Principles of Interaction Design as a Cultural Practice*. Cambridge, Mass.: MIT Press.
- Nadin, V. (2007). The emergence of the spatial planning approach in England. *Planning Practice and Research*, 22(1), 43–62.
- Næss, P., & Saglie, I.-L. (2000). Surviving Between the Trenches: Planning Research, Methodology and Theory of Science. *European Planning Studies*, 8(6), 729–750.
- Narayan, K. (1993). How Native Is a "Native" Anthropologist? *American Anthropologist New Series*, 95(3), 671–686.
- Nardi, B. A. (1996a). *Context and Consciousness: Activity Theory and Human-computer Interaction*. Cambridge, Mass.: MIT Press.
- Nardi, B. A. (1996b). Studying Context: A Comparison of Activity Theory, Situated Action Models, and Distributed Cognition. In B. A. Nardi (Ed.), *Context and Consciousness: Activity Theory and*

- Human Computer Interaction* (pp. 69–102). Cambridge, Mass.: MIT Press.
- Nardi, B., & Miller, J. (1991). Twinkling lights and nested loops: Distributed problem solving and spreadsheet development. *International Journal of Man-Machine Studies*, 34, 161–184.
- Nash, C. (2000). Performativity in practice: some recent work in cultural geography. *Progress in Human Geography*, 24(4), 653–664.
- National Planning Policy Framework. (2012). Department for Communities and Local Government. Retrieved from <http://www.communities.gov.uk/planningandbuilding/planningsystem/planningpolicy/planningpolicyframework/>
- Neuman, M. (1998). Does planning need the plan? *Journal of the American Planning Association*, 64(2), 208–220.
- Newman, P., & Thornley, A. (1996). *Urban Planning in Europe: International Competition, National Systems, and Planning Projects*. Abingdon: Routledge.
- Nicolini, D. (2009a). Zooming in and out: Studying practices by switching theoretical lenses and trailing connections. *Organization Studies*, 30(12), 1391–1418.
- Nicolini, D. (2009b). Zooming in and zooming out: a package of method and theory to study work practices. In S. Ybema, D. Yanow, H. Wels, & F. Kamsteeg (Eds.), *Organizational Ethnography: Studying the complexities of everyday life* (pp. 120–138). London: Sage.
- Nielsen, M. (2014). A wedge of time: Futures in the present and presents without futures in Maputo, Mozambique. *Journal of the Royal Anthropological Institute*, 20(1), 166–182.
- Nora, P. (1972). Mémoire collective. In J. Le Goff, R. Chartier, & J. Revel (Eds.), *La Nouvelle Histoire* (pp. 398–401). Paris: Les Encyclopédies du Savoir Moderne.
- Norman, D. A. (1991). Cognitive Artifacts. In J. M. Carroll (Ed.), *Designing Interaction: Psychology at the Human-Computer Interface* (pp. 17–38). Cambridge: Cambridge University Press.
- Nowotny, H. (1992). Time and Social Theory. *Time & Society*, 1(3), 421–454.
- Nowotny, H. (2015). *The Cunning of Uncertainty*. Cambridge: Polity Press.
- Nyqvist, A. (2015). The corporation performed: minutes from the rituals of annual general meetings. *Journal of Organizational Ethnography*, 4(3), 341–355.
- Ochs, E. (1997). Narrative. In T. van Dijk (Ed.), *Discourse as structure and process* (pp. 185–207). London: Sage.
- Ochs, E., & Capps, L. (2001). *Living narrative: Creating lives in everyday storytelling*. Cambridge, Mass: Harvard University Press.
- Olick, J. K., & Robbins, J. (1998). Social Memory Studies: From “Collective Memory” to the Historical Sociology of Mnemonic Practices. *Annual Review of Sociology*, 24(24), 105–140.
- Orlikowski, W. (1992). The Duality of Technology: Rethinking the concept of technology in organizations. *Organization Science*, 3(3), 398–427.
- Orlikowski, W. (2002). Knowing in Practice: Enacting a Collective Capability in Distributed Organizing. *Organization Science*, 13(3), 249–273.
- Orlikowski, W. (2007). Sociomaterial Practices: Exploring Technology at Work. *Organization Studies*, 28(9), 1435–1448.

- Orlikowski, W. J., & Scott, S. V. (2008a). Sociomateriality: Challenging the Separation of Technology, Work and Organization. *The Academy of Management Annals*, 2(1), 433–474.
- Orlikowski, W. J., & Scott, S. V. (2008b). *The entanglement of technology and work in organizations* (LSE Working Paper Series No. 168). London: Information Systems and Innovation Group, London School of Economics and Political Science.
- Ortner, S. B. (1984). Theory in Anthropology since the Sixties. *Comparative Studies in Society and History*, 26(1), 126-166.
- Othengrafen, F. (2012). *Uncovering the Unconscious Dimensions of Planning: Using Culture as a Tool to Analyse Spatial Planning Practices*. Farnham, Surrey: Ashgate Publishing Ltd.
- Othengrafen, F., & Reimer, M. (2013). The embeddedness of planning in cultural contexts: theoretical foundations for the analysis of dynamic planning cultures. *Environment and Planning A*, 45(6), 1269–1284.
- Owen Hughes, D., & Trautmann, T. R. (Eds.). (1995). *Time: Histories and Ethnologies*. Ann Arbor: University of Michigan Press.
- Pafka, E. (2013). Places as Intersecting Flows: Mapping Urban Morphologies, Functional Constellations and Pedestrian Rhythms. In *Proceedings of Space and Place, 4th Global Conference*. University of Melbourne. Retrieved from <http://www.soacconference.com.au/2013-conference/wp-content/uploads/2014/01/Pafka-Structure.pdf>
- Palazzo, D., & Steiner, F. R. (2012). *Urban Ecological Design: A Process for Regenerative Places*. Washington DC: Island Press.
- Pallagst, K. (2010). Viewpoint: The planning research agenda: shrinking cities – a challenge for planning cultures. *Town Planning Review*, 81(5), i–vi.
- Patel, T., & Rayner, S. (2012). Towards a Transactional Approach to Culture: Illustrating the Application of Douglasian Cultural Framework in a Variety of Management Settings. *European Management Review*, 9(3), 121–138.
- Pearman, A. D. (1985). Uncertainty in Planning: Characterisation, Evaluation, and Feedback. *Environment and Planning B: Urban Analytics and City Science*, 12, 313–320.
- Peattie, L. (1968). *The view from the barrio*. Ann Arbor: University of Michigan Press.
- Peattie, L. (1990). Anthropology and Planning. *Journal of Planning Education and Research*, 9(2), 101–106.
- Peattie, L. (1991). Planning and the Image of the City. *Places*, 7(2), 35–39.
- Perin, C. (1977). *Everything in its Place: Social Order and Land Use in America*. New Jersey: Princeton University Press.
- Perry, M. J. (2003). Distributed Cognition. In J. M. Carroll (Ed.), *HCI Models, Theories, and Frameworks: toward a Multidisciplinary Science* (pp. 212–223). San Francisco: Morgan Kauffman Publishers.
- Perry, M. J. (2013). Socially Distributed Cognition in Loosely Coupled Systems. In S. J. Cowley & F. Vallée-Tourangeau (Eds.), *Cognition Beyond the Brain: Computation, Interactivity and Human Artifice* (pp. 147–169). London: Springer.
- Peterson, D., & Pitz, G. (1988). Confidence, uncertainty, and the use of information. *Journal of*

- Experimental Psychology: Learning, Memory, and Cognition*, 14(1), 85–92.
- Piaget, J. (1932). *The Moral Judgement of the Child*. London: Routledge & Kegan Paul.
- Pickering, A. (1994). After Representation: Science Studies in the Performative Idiom. In *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* (pp. 413–419). Retrieved from <https://doi.org/10.1086/psaprocbienmeetp.1994.2.192953>
- Pickering, A. (1995). *The Mangle of Practice: Time, Agency, and Science*. Chicago: University of Chicago Press.
- Postill, J. (2010). Introduction: Theorising media and Practice. In B. Bräuchler & J. Postill (Eds.), *Theorizing Media and Practice* (pp. 1–27). New York: Berghahn Books.
- Protzen, J. P., & Harris, D. J. (2010). *The Universe of Design: Horst Rittel's Theories of Design and Planning*. Abingdon: Taylor & Francis.
- Proust, M. (2013). *Swann's Way: In Search of Lost Time*. New Haven: Yale University Press.
- Pyne, L. V. (2016). *Bookshelf*. London: Bloomsbury Academic.
- Rabinow, P. (1989). *French Modern: Norms and Forms of the Social Environment*. London: Peter Davies.
- Rapoport, A. (1969). *House form and culture*. Upper Saddle River, NJ: Prentice-Hall.
- Rapoport, E. (2011). Exporting Sustainable Masterplanning: Context, Complexity and Consultants in Hanoi's Gia Lam New Town Project. In *5th International Eco-Cities Conference, 17-18 June, Johns Hopkins University* (pp. 1–23). Baltimore, MD.
- Rauws, W. (2017). Embracing Uncertainty Without Abandoning Planning: Exploring an Adaptive Planning Approach for Guiding Urban Transformations. *disP - The Planning Review*, 53(1), 32–45.
- Rayner, S. (1979). *The Classification and Dynamics of Sectarian Forms of Organisation: Grid/Group Perspectives on the Far-Left in Britain*. Retrieved from <http://discovery.ucl.ac.uk/1349448/1/D32160.pdf>
- Rayner, S. (1982). The Perception of Time and Space in Egalitarian Sects: A Millenarian Cosmology. In M. Douglas (Ed.), *Essays in the Sociology of Perception* (pp. 247–274). London: Routledge & Kegan Paul.
- Rayner, S. (1986). Management of Radiation Hazards in Hospitals: Plural Rationalities in a Single Institution. *Social Studies of Science*, 16(4), 573–591.
- Rayner, S. (2000). Prediction and Other Approaches to Climate Change Policy. In D. Sarewitz, R. A. Pielke, & R. Byerly (Eds.), *Prediction: Science, Decision Making, and the Future of Nature* (pp. 269–296). Washington DC: Island Press.
- Rayner, S. (2012a). Uncomfortable knowledge: The social construction of ignorance in science and environmental policy discourses. *Economy and Society*, 41(1), 107–125.
- Rayner, S. (2012b). *Water security and the use of climate information in US water management* (Seminar). Oxford. Retrieved from <https://www.oxfordmartin.ox.ac.uk/event/1231>
- Renfrew, C. (2004). Towards a theory of material engagement. In E. DeMarrais, C. Gosden, & C. Renfrew (Eds.), *Rethinking Materiality: the Engagement of Mind with the Material World* (pp. 23–32). Cambridge: McDonald Institute Monographs.

- Renfrew, C. (2007). *Prehistory, the Making of the Human Mind*. London: Weidenfeld and Nicolson.
- Resnick, L., Levine, J., & Teasley, S. (Eds.). (1991). *Perspectives on Socially Shared Cognition*. Washington DC: American Psychological Association.
- Riles, A. (1998). Infinity within the Brackets. *American Ethnologist*, 25(3), 378–398.
- Riles, A. (2000). *The Network Inside Out*. Ann Arbor: University of Michigan Press.
- Riles, A. (Ed.). (2006). *Documents: Artifacts of Modern Knowledge*. Ann Arbor: University of Michigan Press.
- Rittel, H. W. J. (1972). On the Planning Crisis: Systems Analysis of the First and Second Generations. *Bedriftsøkonomen*, 8, 390–97.
- Rittel, H. W. J. (2010). The Reasoning of Designers: Paper for the International Congress on Planning and Design Theory [1987]. In J.-P. Protzen & D. J. Harris (Eds.), *The Universe of Design: Horst Rittel's Theories of Design and Planning* (pp. 187–196). Abingdon: Routledge.
- Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, 4(2), 155–169.
- Robbins, E. (1994). *Why Architects Draw*. Cambridge, Mass.: MIT Press.
- Rodman, M. (1993). Beyond built form and culture in anthropological study of residential community spaces. In R. L. Rotenberg & G. W. McDonogh (Eds.), *The Cultural Meaning of Urban Space* (pp. 123–138). Santa Barbara, CA: ABC-CLIO.
- Rodwin, L., & Bishwapriya, S. (Eds.). (2000). *The Profession of City Planning: Changes, Images and Challenges: 1950-2000*. Piscataway, NJ: Transaction Publishers.
- Rogers, Y., & Ellis, J. (1994). Distributed Cognition: an alternative framework for analyzing and explaining collaborative working. *Journal of Information Technology*, 9(2), 119–128.
- Rosen, M. (1991). Coming to terms with the field: Understanding and doing organizational ethnography. *Journal of Management Studies*, 28(1), 1–25.
- Rotenberg, R. (1996). Extraordinary Vienna: Identity and the Metropolitan Project. *City & Society*, 8(1), 82–100.
- Ryan, B. D. (2011). Reading through a plan: A visual interpretation of what plans mean and how they innovate. *Journal of the American Planning Association*, 77(4), 309–327.
- Rybacz, D. (1967). Confidence and Accuracy as a Function of Experience in Judgment-Making in the Absence of Systematic Feedback. *Perceptual and Motor Skills*, 24(1), 331–334.
- Rydin, Y. (2010). Actor-network theory and planning theory: a response to Boelens. *Planning Theory*, 9(3), 265–268.
- Rydin, Y. (2012). Using Actor-Network Theory to understand planning practice: Exploring relationships between actants in regulating low-carbon commercial development. *Planning Theory*, 12(1), 22–45.
- Rydin, Y. (2014). The challenges of the “material turn” for planning studies. *Planning Theory & Practice*, 15(4), 590–595.
- Rydin, Y., & Tate, L. (2016). *Actor Networks of Planning: Exploring the Influence of Actor Network Theory*. London: Taylor & Francis.
- Rydin, Y., Thornley, A., Scanlon, K., & West, K. (2002). *The Greater London Authority - a Clash of*

- Organisational Cultures* (LSE London Discussion Paper 6, March 2002).
- Rykwert, J. (1988). *The Idea of a Town: The Anthropology of Urban Form in Rome, Italy and the Ancient World*. Cambridge, Mass.: MIT Press.
- Ryle, G. (1949). *The Concept of Mind*. London: Hutchinson and Company.
- Sadler, P. J. (1970). Leadership Style, Confidence in Management, and Job Satisfaction. *The Journal of Applied Behavioral Science*, 6(1), 3–19.
- Salet, W., Bertolini, L., & Giezen, M. (2013). Complexity and Uncertainty: Problem or Asset in Decision Making of Mega Infrastructure Projects. *International Journal of Urban and Regional Research*, 37, 1984–2000.
- Salomon, G. (1997). *Distributed Cognitions: Psychological and Educational Considerations*. Cambridge University Press.
- Sandercock, L. (1998). *Making the Invisible Visible: A Multicultural Planning History*. Oakland, CA: University of California Press.
- Sandercock, L. (2005). Picking the Paradoxes: A Historical Anatomy of Australian Planning Cultures. In B. Sanyal (Ed.), *Comparative Planning Cultures* (pp. 309–330). Abingdon: Taylor & Francis.
- Sanyal, B. (Ed.). (2005a). *Comparative Planning Cultures*. London: Routledge.
- Sanyal, B. (2005b). Hybrid planning cultures: the search for the global cultural commons. In B. Sanyal (Ed.), *Comparative Planning Cultures* (pp. 3–25).
- Sanyal, B. (2008). Critical about Criticality. *UCLA Journal of Urban Planning*, 15, 143–160.
- Sanyal, B. (2014). Celebrating the idea of planning. *Planning Theory and Practice*, 15(1), 95–122.
- Sapsed, J., & Salter, A. (2004). Postcards from the Edge: Local Communities, Global Programs and Boundary Objects. *Organization Studies*, 25(9), 1515–1534.
- Savransky, M. (2016). Modes of Mattering: Barad, Whitehead, and Societies. *Rhizomes: Cultural Studies in Emerging Knowledge*, 1–24. Retrieved from: <https://doi.org/10.20415/rhiz/030.e08>
- Schatzki, T. R. (2001). Introduction: Practice Theory. In T. R. Schatzki, K. Knorr-Cetina, & E. von Savigny (Eds.), *The Practice Turn in Contemporary Theory* (pp. 1–14). London: Routledge.
- Schön, D. A. (1982). Some of What a Planner Knows: A Case Study of Knowing-in-Practice. *Journal of the American Planning Association*, 48(3), 351–364.
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. Aldershot: Avebury.
- Schön, D. A., & Rein, M. (1994). *Frame Reflection: Toward the Resolution of Intractable Policy Controversies*. New York: Basic Books.
- Schutz, A. (1967). *Phenomenology of the Social World*. Evanston, IL: Northwestern University Press.
- Scott, J. C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT: Yale University Press.
- Scott, W. R. (2013). *Institutions and Organizations: Ideas, Interests, and Identities*. London: Sage Publications.
- Sellen, A. J., & Harper, R. (2002). *The Myth of the Paperless Office*. Cambridge, Mass: MIT Press.

- Sellerberg, A.-M. (1982). On Modern Confidence. *Acta Sociologica*, 25(1), 39–48.
- Sheppard, E., & McMaster, R. B. (Eds.). (2003). *Scale and Geographic Inquiry: Nature, Society, and Method*. Hoboken, NJ: Wiley-Blackwell.
- Shirvani, H. (1985). *The Urban Design Process*. New York: Van Nostrand Reinhold Company.
- Shotter, J. (2013). Reflections on Sociomateriality and Dialogicality in Organization Studies: From “Inter-” to “Intra-Thinking” ... in Performing Practices. In P. R. Carlile, D. Nicolini, A. Langley, & H. Tsoukas (Eds.), *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies* (pp. 32–57). Oxford: Oxford University Press.
- Shumar, W., & Renninger, K. A. (2002). Introduction: On Conceptualizing Community. In K. A. Renninger & W. Shumar (Eds.), *Building Virtual Communities: Learning and Change in Cyberspace*. Cambridge: Cambridge University Press.
- Sies, M. C., & Silver, C. (1996). *Planning the Twentieth-Century American City*. Baltimore, MD: Johns Hopkins University Press.
- Simakova, E. (2013). *Marketing Technologies: Corporate Cultures and Technological Change*. London: Taylor & Francis.
- Simmel, G. (1964). Types of Social Relationships. In K. H. Wolf (Ed.), *The Sociology of Georg Simmel* (pp. 317–329). New York: The Free Press.
- Simon, H. A. (1956). *Models of Man*. New York: J. Wiley and Sons.
- Sitte, C. (1889). *The Art of Building Cities: City Building According to its Artistic Fundamentals* (1945th ed.). New York: Reinhold.
- Skaburskis, A. (2008). The origin of “wicked problems.” *Planning Theory and Practice*, 9(2), 277–280. <https://doi.org/10.1080/14649350802041654>
- Smith, V. (1997). New Forms of Work Organization. *Annual Review of Sociology*, 23(1), 315–339.
- Smith, V. (2001). Ethnographies of Work and the Work of Ethnographers. In P. Atkinson, A. Coffey, S. Delamont, J. Lofland, & L. Lofland (Eds.), *Handbook of Ethnography* (pp. 220–234). London: Sage Publications.
- Snyder, B. H. (2016). *The Disrupted Workplace: Time and the Moral Order of Flexible Capitalism*. Oxford: Oxford University Press.
- Soja, E. W. (1989). *Postmodern Geographies: The Reassertion of Space in Critical Social Theory*. London: Verso.
- Spinelli, G., Perry, M., & O’Hara, K. (2005). Understanding complex cognitive systems: the role of space in the organisation of collaborative work. *Cognition, Technology & Work*, 7(2), 111–118.
- Spradley, J. P. (1979). *The Ethnographic Interview*. New York: Holt, Rinehart and Winston.
- Spradley, J. P. (1980). *Participant Observation*. New York: Holt, Rinehart and Winston.
- Stacey, R. (2007). *Strategic Management and Organisational Dynamics: The Challenge of Complexity*. Upper Saddle River, NJ: Prentice-Hall.
- Stahl, G. (Ed.). (2002). Shared meaning, common ground, group cognition. In *Computer support for collaborative learning: Foundations for a CSCL community* (pp. 1–21). Boulder, CO: Psychology Press.
- Stahl, G. (2006). *Group Cognition: Computer Support for Building Collaborative Knowledge*.

- Cambridge, Mass.: MIT Press.
- Stahl, G. (2017). *Essays in Philosophy of Group Cognition*. Morrisville, CA: LULU Press.
- Star, S. L. (2010). This is Not a Boundary Object: Reflections on the Origin of a Concept. *Science Technology & Human Values*, 35(5), 601–617.
- Star, S. L., & Griesemer, J. R. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 19(3), 387–420.
- Steiner, F. (2011). Commentary: Planning and Design - Oil and Water or Bacon and Eggs? *Journal of Planning Education and Research*, 31(2), 213–216.
- Steinø, N. (2003). *Vision, Plan and Reality – Urban Design between Conceptualization and Realization*. Phd Thesis, Aarhus University. Retrieved from: <http://homes.create.aau.dk/steino/phd/steino-thesis.pdf>
- Stengers, I. (2013). Introductory Notes on an Ecology of Practices. *Cultural Studies Review*, 11(1), 183–196.
- Stewart, J. R., Gapenne, O., & Di Paolo, E. A. (Eds.). (2010). *Enaction: Toward a New Paradigm for Cognitive Science*. Cambridge, Mass.: MIT Press.
- Stoler, A., & Strassler, K. (2000). Castings for the Colonial: Memory Work in "New Order" Java. *Comparative Studies in Society & History*, 42(1), 4–48.
- Strathern, M. (1991). *Partial Connections*. Walnut Creek, CA: Rowman & Littlefield Publishers Inc.
- Strauss, C., & Quinn, N. (1999). *A Cognitive Theory of Cultural Meaning*. Cambridge: Cambridge University Press.
- Sturdy, A., Brocklehurst, M., Winstanley, D., & Littlejohns, M. (2006). Management as a (Self) Confidence Trick: Management Ideas, Education and Identity Work. *Organization*, 13(6), 841–860.
- Suchman, L. (1987). *Plans and Situated Actions: The Problem of Human-Machine Communication*. Cambridge: Cambridge University Press.
- Suchman, L. (1995). Making Work Visible. *Communications of the ACM*, 38(9), 56–64. Retrieved from <http://guzdial.cc.gatech.edu/hci-seminar/uploads/1/Suchman's+Making+Work+Visible.pdf>
- Suchman, L. (1996). Constituting Shared Workspaces. In Y. Engeström & D. Middleton (Eds.), *Cognition and Communication at Work* (pp. 35–60). Cambridge: Cambridge University Press.
- Suchman, L., & Trigg, R. (1991). Understanding practice: Video as a medium for reflection and design. In J. Greenbaum & M. Kyng (Eds.), *Design at Work: Cooperative Design of Computer Systems*. Hillsdale, NJ: Lawrence Erlbaum.
- Suh, S. H., Kang, S. K., Chung, D. H., & Stroud, I. (2008). *Theory and Design of CNC Systems*. London: Springer.
- Sutton, J. (2009). Remembering. In P. Robbins & M. Aydede (Eds.), *Cambridge Handbook of Situated Cognition* (pp. 217–235). Cambridge: Cambridge University Press.
- Swyngedouw, E. (1997). Neither Global nor Local: "Glocalization" and the Politics of Scale. In K. Cox (Ed.), *Spaces of globalization: Reasserting the Power of the Local* (pp. 137–166). London: Guilford/Longman.

- Tajbakhsh, K. (2005). Planning Culture in Iran: Centralization and Decentralization and Local Governance in the Twentieth Century (The Case for Urban Management and Planning). In B. Sanyal (Ed.), *Comparative Planning Cultures* (pp. 67–90). Abingdon: Routledge.
- Talen, E. (1997). Success, Failure, and Conformance: An Alternative Approach to Planning Evaluation. *Environment and Planning B: Planning and Design*, 24(4), 573–587.
- Talen, E. (2005). *New Urbanism & American Planning: The Conflict of Cultures*. Abingdon: Routledge.
- Talen, E., & Ellis, C. (2004). Cities as Art: Exploring the Possibility of an Aesthetic Dimension in Planning. *Planning Theory and Practice*, 5(1), 11–32.
- Tansey, J., & Rayner, S. (2009). Cultural Theory and Risk. In R. L. Heath & H. D. O'Hair (Eds.), *Handbook of Risk and Crisis Communication* (pp. 53–79). New York: Routledge.
- Taylor, C. (2004). *Modern Social Imaginaries*. Durham and London: Duke University Press.
- Taylor, Z. (2013). Rethinking planning culture: a new institutionalist approach. *Town Planning Review*, 84(6), 683–702.
- Te Brömmelstroet, M., Hoetjes, P., & Straatemeier, T. (2006). Linking information to strategic planning processes. In *International Workshop Modeling and Decision Support for Urban Planning held at the School of Urban Design, Wuhan University, China, October 21-23*.
- Tewdwr-Jones, M., Phelps, N., & Freestone, R. (2013). *The Planning Imagination: Peter Hall and the Study of Urban and Regional Planning*. London: Taylor & Francis.
- Thompson, E. (2007). *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*. Cambridge, Mass.: Harvard University Press.
- Thompson, E. P. (1967). Time, Work-Discipline, and Industrial Capitalism. *Past and Present*, 38, 56–97.
- Thompson, M., Ellis, R. J., & Wildavsky, A. B. (1990). *Cultural Theory*. Boulder, San Francisco: Westview Press.
- Thompson, M., & Verweij, M. (2004). The Case for Clumsiness. In *Research Collection School of Social Sciences, Paper 25*. Singapore. Retrieved from http://ink.library.smu.edu.sg/cgi/viewcontent.cgi?article=1024&context=soss_research
- Thrift, N. (1996). New Urban Eras and Old Technological Fears; Reconfiguring the Goodwill of Electronic Age. *Urban Studies*, 33(8), 1463–1493.
- Thrift, N. (2008). *Non-representational theory: space, politics, affect*. Abingdon: Routledge.
- Throgmorton, J. A. (1996). *Planning as Persuasive Storytelling: The Rhetorical Construction of Chicago's Electric Future*. Chicago: University of Chicago Press.
- Tribble, E. B. (2005). Distributing Cognition in the Globe. *Shakespeare Quarterly*, 56(2), 135–155.
- Tufte, E. R. (2003). *The Cognitive Style of PowerPoint: Pitching Out Corrupts Within*. Cheshire, CT: Graphics Press.
- Turnbull, D. (1991). Inside the Gothic Laboratory: "Local" Knowledge and the Construction of Chartres Cathedral. *Thesis Eleven*, 30(1), 161–174.
- Turnbull, D. (1993). The Ad Hoc Collective Work of Building Gothic Cathedrals with Templates, String, and Geometry. *Science, Technology, & Human Values*, 18(3), 315–340.
- Turnbull, D. (2007a). Maps and Plans in "Learning to See": the London Underground and Chartres

- Cathedral as Examples of Performing Design. In C. Grasseni (Ed.), *Skilled Visions: Between Apprenticeship and Standards* (pp. 125–144). New York: Berghahn Books.
- Turnbull, D. (2007b). Maps narratives and trails: Performativity, hodology and distributed knowledges in complex adaptive systems - An approach to emergent mapping. *Geographical Research*, 45(2), 140–149.
- Tversky, B. (2011). Visualizing Thought. *Topics in Cognitive Science*, 3, 499–535.
- Tversky, B. (2014). The Cognitive Design of Tools of Thought. *Review of Philosophy and Psychology*, 6(1), 99–116.
- Tversky, B., Zacks, J., Lee, P., & Heiser, J. (2000). Lines, Blobs, Crosses and Arrows: Diagrammatic Communication with Schematic Figures. In M. Anderson, P. Cheng, & V. Haarslev (Eds.), *Theory and Application of Diagrams: First International Conference, Diagrams 2000, Edinburgh, Scotland, September 1-3* (pp. 221–230). Berlin Heidelberg: Springer-Verlag.
https://doi.org/10.1007/3-540-44590-0_21
- van Loon, E., & Bal, R. (2014). Uncertainty and the Development of Evidence-Based Guidelines. *Valuation Studies*, 2(1), 43–64.
- Van Maanen, J. (1995). An end to innocence: the ethnography of ethnography. In J. Van Maanen (Ed.), *Representation in Ethnography* (pp. 1–35). Thousand Oaks, CA: Sage Publications.
- Verma, N. (1993). Metaphor and Analogy as Elements of a Theory of Similarity for Planning. *Journal of Planning Education and Research*, 13(1), 13–25.
- Verma, N. (1995). What is Planning Practice? The Search for Suitable Categories. *Journal of Planning Education and Research*, 14(3), 178–182.
- Victor, B., & Boynton, A. C. (1998). *Invented Here: Maximizing Your Organization's Internal Growth and Profitability*. Cambridge, Mass.: Harvard Business School Press.
- Vike, H. (2013). Utopian Time and Contemporary time: Temporal Dimensions of Planning and Reform in the Norwegian Welfare State. In S. Abram & G. Weszkalnys (Eds.), *Elusive Promises: Planning in the Contemporary World* (pp. 35–56). Oxford: Berghahn Books.
- Virilio, P. (1991). *The Aesthetics of Disappearance*. Los Angeles: Semiotext(e).
- Vygotsky, L. S. (1978). *Mind in Society: Development of Higher Psychological Processes*. (M. Cole, Ed.). Cambridge, Mass: Harvard University Press.
- Ward, S. V. (2012). Re-examining the International Diffusion of Planning. In R. Freestone (Ed.), *Urban Planning in a Changing World: The Twentieth Century Experience* (pp. 40–60). Abingdon: Routledge.
- Ward, S. V. (2013). A Cultural History of Modern Urban Planning. In G. Young & D. Stevenson (Eds.), *The Ashgate Research Companion to Planning and Culture* (pp. 37–52). Aldershot: Ashgate.
- Watson, V. (2002). Do we learn from planning practice? The contribution of the practice movement to planning theory. *Journal of Planning Education and Research*, 22(2), 178–187.
- Watson, V. (2003). Conflicting rationalities: Implications for planning theory and ethics. *Planning Theory and Practice*, 4, 385–407.
- Watson, V. (2008). Down to Earth: Linking Planning Theory and Practice in the “Metropole” and Beyond. *International Planning Studies*, 13(3), 223–237.
- Webster, F. (2005). Making Sense of the Information Age. *Information, Communication & Society*,

8(4), 439–458.

- Weick, K. E. (1995). *Sensemaking in Organizations*. London: Sage Publications.
- Weinberger, D. (2007). *Everything is miscellaneous: The power of the new digital disorder*. New York: Times Books.
- Wenger, E. (2000). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.
- Wenger, E., & Lave, J. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Weszkalnys, G. (2010). *Berlin, Alexanderplatz: Transforming Place in a Unified Germany*. New York: Berghahn Books.
- Whipp, R., Adam, B., & Sabelis, I. (Eds.). (2002). *Making Time: Time and Management in Modern Organizations*. Oxford: Oxford University Press.
- Whitehead, A. N. (1978). *Process and Reality*. New York: Free Press.
- Wildavsky, A. (1973). If planning is everything, maybe it's nothing. *Policy Sciences*, 4(2), 127–153.
- Wilson, A. G. (1968). Models in urban planning: Synoptic review of recent literature. *Urban Studies*, 5(3), 249–276.
- Wood, D. (1991). Maps are Territories: Review Article. *Cartographica: The International Journal for Geographic Information and Geovisualization*, 28(2), 73–80.
- Wood, D. (2012). The Anthropology of Cartography. In L. Roberts (Ed.), *Mapping Cultures: Place, Practice, Performance* (pp. 280–303). London: Palgrave Macmillan.
- Woolgar, S. (1991). Configuring the user: the case of usability trials. *The Sociological Review Monograph Series, Special Issue: A Sociology of Monsters: Essays on Power, Technology and Domination*, 38(1), 58–99.
- Woolgar, S., & Lezaun, J. (2013). The wrong bin bag: A turn to ontology in science and technology studies? *Social Studies of Science*, 43(3), 321–340.
- Wulff, H. (1998). *Ballet across Borders: Career and Culture in the World of Dancers*. London: Bloomsbury Academic.
- Wulff, H. (2000). Access to a closed world: methods for a multilocal study on ballet as a career. In V. Amit (Ed.), *Constructing the Field: Ethnographic Fieldwork in the Contemporary World* (pp. 147–161). London: Routledge.
- Wylie, L. W. (1957). *Village in the Vaucluse*. Cambridge, Mass.: Harvard University Press.
- Yakel, E. (2007). Digital curation. *OCLC Systems & Services: International Digital Library Perspectives*, 23(4), 335–340.
- Yakura, E. K. (2002). Charting Time: Timelines as Temporal Boundary Objects. *The Academy of Management Journal*, 45(5), 956–970.
- Yaneva, A. (2005). Scaling up and down: Extraction trials in architectural design. *Social Studies of Science*, 35(6), 867–894.
- Yaneva, A. (2008). Obsolete Ways of Designing?: Scale Models at the Time of Digital Media Technologies. In J. H. Gleiter, N. Korrek, & G. Zimmermann (Eds.), *Die Realität des Imaginären: Architektur und das digitale Bild* (pp. 83–91). Weimar: Verlag der Bauhaus-Universität Weimar.

- Yaneva, A. (2009a). *Made by the Office for Metropolitan Architecture: An Ethnography of Design*. Rotterdam: 010 Publishers.
- Yaneva, A. (2009b). Making the Social Hold: Towards an Actor-Network Theory of Design. *Design and Culture*, 1(3), 273–288.
- Yaneva, A. (2009c). *The Making of a Building: A Pragmatist Approach to Architecture*. Oxford: Peter Lang.
- Yates, J., & Orlikowski, W. (2007). The PowerPoint Presentation and Its Corollaries: How Genres Shape Communicative Action in Organizations. In M. Zachry & C. Thralls (Eds.), *Communicative Practices in Workplaces and the Professions: Cultural Perspectives on the Regulation of Discourse and Organizations* (pp. 67–92). New York: Taylor & Francis.
- Ybema, S., & Kamsteeg, F. (2009). Making the familiar strange: a case for disengaged ethnography. In S. Ybema, D. Yanow, H. Wels, & F. Kamsteeg (Eds.), *Organizational Ethnography: Studying the complexities of everyday life* (pp. 101–119). London: Sage Publications.
- Young, G. (2008). The Culturization of Planning. *Planning Theory*, 7(1), 71–91.
- Young, G. (2012). *Reshaping Planning with Culture*. Farnham, Surrey: Ashgate Publishing Ltd.
- Zandvoort, M., Van der Vlist, M. J., Klijn, F., & Van den Brink, A. (2018). Navigating amid Uncertainty in Spatial Planning. *Planning Theory*, 17(1), 96–116.
- Zeitlyn, D. (2012). Anthropology in and of the Archives: Possible Futures and Contingent Pasts. Archives as Anthropological Surrogates. *Annual Review of Anthropology*, 41(1), 461–480.
- Zerubavel, E. (1976). Timetables and Scheduling: On the Social Organization of Time. *Sociological Inquiry*, 46(2), 87–94.
- Zerubavel, E. (1979). *Patterns of Time in Hospital Life*. Chicago: University of Chicago Press.
- Zerubavel, E. (1985). *Hidden Rhythms: Schedules and Calendars in Social Life*. Oakland: University of California Press.
- Zerubavel, E. (1997). *Social Mindscales: An Invitation to Cognitive Sociology*. Cambridge, Mass.: Harvard University Press.
- Zerubavel, E. (2003). *Time Maps: Collective Memory and the Social Shape of the Past*. Chicago: University of Chicago Press.
- Zerubavel, E. (2012). *Ancestors and Relatives: Genealogy, Identity, and Community*. Oxford: Oxford University Press.
- Zerubavel, E. (2015). *Hidden in Plain Sight: The Social Structure of Irrelevance*. Oxford: Oxford University Press.
- Zhang, J., & Patel, V. L. (2006). Distributed Cognition, Representation, and Affordance. *Pragmatics & Cognition*, 14(2), 333–341.