The transformation of public space: Mobile technology practices and urban liminalities

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Certificate of original authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree as part of the collaborative doctoral degree and/or fully acknowledged within the text.

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Preface

This PhD research began in 2011 at a time when I owned the Apple iPhone 3G, a mobile computing device that by this time was already obsolete. As this infers, I was late to the iPhone trend, and have also been a reluctant adopter of several technology-driven trends of the previous decade, including having staunchly refused to join Facebook, LinkedIn, and only reluctantly creating Twitter and Instagram accounts initially as part of my teaching commitments and research. Nonetheless, the rapid and intense popularity of personal, portable, mobile computing, and new media activities, as well as the behavioural, social, and cultural practices they engender has intrigued me. Despite such issues being regularly discussed in the context of paradigmatic change in and for the built environment, they remain peripheral concerns for many of the built environment disciplines, and particularly in my home discipline of architecture.

These observations led to teaching in several research-led architectural design studios. An early focus explored the opportunities for applying emerging digital technologies in public transport environments as documented in two book publications *Infostructure: A transport research project* (Gardner et al. 2010) and *Interchanging: Future designs for responsive transport environments* (Gardner et al. 2014). More recently, this has extended to the design and coordination of the Bachelor of Computational Design subjects such as *Ubiquitous Cities* in which built environment design approaches are brought together with interaction design technologies and thinking, which is outlined in the recent paper "SMLXL: Thinking between scales and designing with data for 'smarter' cities" (Gardner and Hespanhol 2016). Accordingly, this research explores how disciplinary approaches and conceptual frameworks have informed various technourban imaginaries including those that occlude mobile technology practices and those that centralise and thus elevate them.

Exploring contemporary mobile digital technology as part of a research project has been challenging not only with respect to the wide range of disciplines that now attend to this topic, and thus the large volume of research produced, but moreover in the ways that mobile technologies and their associated practices have, and continue to, rapidly evolve. Equally, the scholarly publication cycle that connects to various themes around mobile technologies is fast-paced and prolific, providing the additional challenge of managing

ever-more *potentially* relevant information, theories, and perspectives. Significantly, the condition of digital information-overload is also a condition of everyday life. Somewhat ironically, but following the capitalist mode of creative destruction,[1] digital information-overload that—in part—has been driven by the technological affordances of Web 2.0 and a shift towards a so-called participatory culture, breeds ever more demand for ways to filter, aggregate, and synthesise vast quantities of information. As Kim Arlington has recently reflected "[W]e use our smartphones to use our smartphones less, installing apps that monitor and limit our activity" (2016, p.20). In ways similar to this, the nature of researching and the shape of the research itself has become subject to the very conditions I explore.

During the course of this PhD I have had time away from this research to have our first baby. Since returning I have had to give consideration to a number of newly published works that attend to matters of mobile technology practices in relation to urban public space and spatial theorisation, such as Katherine Willis' book *Netspaces: Space and place in a networked world* (2016), but also the edited publication *Architecture and Interaction: Human Computer Interaction in Space and Place* (Dalton et al. 2016) that, in ways similar to this thesis, addresses the significance of actual and potential overlaps of the built environment traditions and Human Computer Interaction (HCI). Equally, it has been necessary to take account of recent and relevant events connected to mobile technology practices in urban public space, such as the *Pokémon Go* phenomena. In this regard the theoretical approach of this thesis and the philosophically-orientated questions it asks have proved somewhat resilient to the changing nature of contemporary technology.

In 2017 as this thesis comes to a conclusion, the iPhone is now at release 7+ and will celebrate its 10-year anniversary.[2] I am still—but only just—using an iPhone 5, but I know that ultimately resistance to an upgrade is futile.

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[1] The concept of 'creative destruction' describes the essential force of capitalism as one of continuous change, where recurrent economic cycles "…incessantly revolutionise the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Schumpeter quoted in Zukin 1991, p.4).

[2] https://www.theguardian.com/commentisfree/2016/nov/27/2007-not-2016-year-world-turned-upside-down-rapid-technological-change

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Abstract

Since the mid-twentieth century, various architectural, urban, cultural, and computer science discourses have advanced the rhetoric that contemporary information and communications technologies (ICTs) will fundamentally transform the built and urban environment. More recently, communications and media studies, as well as computer science allied fields such as human computer interaction (HCI) and interaction design have directed significant attention to the urban contexts in which mobile information and communications technologies (mICT) are used, and on the so-called transformative practices of mobile 'location-awareness'. These diverse fields, that simultaneously attend to the topics of urbanism, space, and technology, bring alternate perspectives, methods, and theories to bear on the notion of urban transformation. Yet equally, they also contribute to a growing body of discourse that situates mobile technology practices as a force of radical and positive urban transformation. This thesis argues that understanding and representing the impacts of mobile technology practices on the aesthetic, symbolic, and lived experience of urban public space is a contestable territory subject to a range of technical, socio-economic, and cultural variables that are difficult to account for from any singular disciplinary perspective.

Accordingly, this thesis adopts an interdisciplinary method that examines the selected discourse through the lens of liminal theory initially developed by anthropologist Victor Turner from observations of tribal ritual (1967, 1974a, 1974b, 1977a, 1977b, 1982, 1985)—a theory that has much to say on the concepts and processes of transformation. This constructs a unique critique of claims that mobile technology practices have transformed urban public space by unpacking and examining a number of underlying assumptions and ideals that connect to key conceptual frameworks as well as disciplinary biases. From this perspective, this thesis argues that while mobile technology practices have influenced urban conditions—in both a positive and negative sense—from social practices, and workplace organisation, to ways of moving, they can be alternately conceptualised as liminal triggers that invoke ambivalent representations of urban public space over its radical transformation.

The discourse examined in this thesis points to a significant investment in research that attends to the interrelationships between emerging digital technologies and the built

environment in the social, cultural, and computer sciences, whereas limited engagement from the architectural discipline. As a contribution to interdisciplinary thinking the value of this thesis to the architectural discipline lies in its presentation and critique of these alternate disciplinary perspectives that have 'made visible' the often-abstract impacts of mobile technology practices on and within urban public space. With an eye to the current technourban imaginary and policy vehicle of the smart city, this thesis contends that from this more informed position the architectural discipline can offer much-needed critique on the relationships between emerging technologies and the built environment. The corollary of engaging and adapting a liminal theoretical gaze here is the problematisation of liminal space itself, and a further contribution to its history and methodological range.

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List of Abbreviations

ABS – Australia Bureau of Statistics

Apps – mobile smart device software applications (i.e. for smartphone, tablet, iPad)

AR – Augmented Reality

CNU – Charter for New Urbanism

HCI – Human computer interaction

ICTs – Information communications technologies

mICTs – Mobile information communications technologies

LBG – Location-based game

LBS – Location-based service

LBSN – Location-based social networking

PHM – Powerhouse Museum

RFID – Radio-frequency identification

SCOT - Social construction of technology

STS – Science and technology studies

Ubicomp – Ubiquitous computing

VR – Virtual reality

Chapter 1: Introduction

> *"Based on [a mobile phone use study by Chen and Lever (2005)] and one's own casual observation, it does seem that public space is being transformed by individualized, portable information and communication technology" (Katz 2006, p.4).*
>
> *"While the development of telecommunications and of cities has always been intertwined, the advent of the mobile phone has not only intensified such relations – it has significantly transformed them" (Hjorth et al. 2008, p.1).*

Since the mid-twentieth various architectural, urban, cultural, and computer science discourses have advanced the rhetoric that contemporary information and communications technologies (ICTs) will fundamentally transform the built and urban environment. More recently contemporary practices around mobility, mobile information and communications technologies (mICT), and mobile location-awareness, collectively referred to here as mobile technology practices, are argued to have become increasingly significant to the transformation of social, cultural, and spatial relationships (de Souza e Silva and Sheller 2015). The rapid global uptake of mICTs since the early 2000s, coupled with their prevailing presence of use in urban public space has made mobile technology practices a viable and appealing subject of research from social and behavioural perspectives in anthropology, sociology, and cultural studies, technical and interactional perspectives in the computer sciences, and media content perspectives in communications and media studies. Consequently, through the lens of mICTs research these aforementioned disciplines have directed increasing attention towards the conditions of urban public space and contributed to a growing body of discourse that situates mobile technology practices as a force of both radical and positive urban transformation.

Research studies since the early 2000s have explored the implications of mobile technology practices and produced compelling evidence of changed ways of moving, socialising, behaving, and interacting in urban public space, as well as new methods of analysis. Collectively, this constitutes an interdisciplinary body of discourse that simultaneously attends to the topics of urbanism, space, and technology, and brings an alternate disciplinary perspectives, methods, and theories to bear on the notion of urban transformation. Yet, even as they enter into an arguably contestable territory subject to a

range of technical, socio-economic, and cultural variables, claims that associate mobile technology practices to notions of urban transformation find limited contest from within the built environment focused disciplines of architecture, landscape architecture, and urban studies. It is on this basis, and from the position of a researcher within the architectural discipline that this thesis proceeds with the aim of constructing a critical framework to examine and call into question a selected range of discourse that connects mobile technology practices to notions of urban transformation.

Examining how mobile technology practices are discursively implicated in contemporary urban spatial processes and urban transformation is approached in this thesis by adopting the interdisciplinary notion of liminality as a framework to critique a selected range of urban, architectural, cultural, and computer science allied discourses. This takes up anthropologist Victor Turner's (1967, 1974a, 1974b, 1977a, 1977b, 1982, 1985) key notion of liminality, that describes a staged process of 'spatial' transformation, to examine claims that mobile technology practices have transformed urban public space by revealing their underlying assumptions, key conceptual frameworks, and disciplinary biases. This includes unpacking how disciplinary interpretations of key concepts such as public and private space are invoked in discourse that describes qualitative, empirical mobile technology practice research, including observation and participant studies, and the ways they are linked to theorisations of urban transformation.

1.1 Research problem context: From ICTs to mobile technology practices

To bring into relationship the subjects of contemporary ICTs and the built environment, and more specifically, mobile technology practices and urban public space, inherently suggests their interrelationships cannot be adequately explained from a singular disciplinary perspective. In the case of the built environment traditions, extant materialist or physicalist ways of thinking about urban public space have long limited both the interest in, and the ways of understanding ICTs in and for the built environment. Particularly, exploring the impact of ICTs in the context of architecture, landscape architecture, and urban studies for example, comes up against an inherent disposition towards visuality, permanence, and the anchoring of meaning and

significance to physical and material realities. Put plainly, the impact of ICTs in the built environment remains difficult to 'see'.

The forms of communication and information generation and exchange enabled by and through ICTs are typically characterised as intangible, immaterial, disembodied, and ephemeral. From this perspective, conceiving of ICTs in and for the built environment conflicts with disciplinary, as well as popular value judgements that elevate notions of permanence, fixity, longevity, and timelessness, and moreover, that ground these values in concrete materialities. Understandably, as conditions of impermanence and indeterminacy are less comfortably accounted for in the built environment traditions, so it follows that the methodologies and theoretical frameworks necessary to reveal and examine such conditions, and thus understand their potential, are either non-existent or incompatible.

Scholars have long-implored the built environment traditions to shift their dominant gaze from the "…visible, tangible and perceivable aspects of urban life" (Graham and Marvin 1996, p.50). Claims that ICTs will significantly reconfigure enduring understandings of time and space, as well as the concept of public space itself, have been addressed by a host of scholars within the built environment tradition, and particularly in Geography, since the 1990s, including notably Stephen Graham and Simon Marvin (1996), Michael Batty (1990), William J. Mitchell (1995, 1999, 2000, 2003) and Anthony Townsend (2000). While approaching a similar topic from different disciplinary origins, what Batty, Mitchell, and Townsend each identified were the ways digital technologies were reconfiguring the established (traditional) information supply system of cities. While Mitchell initially discussed the predicted impacts of a range of ICTs more broadly, in the oft-cited paper *Life in the Real-Time City: mobile telephones and Urban Metabolism* (2000) Townsend shifted the focus to the impacts of *mobile* communications technologies (2000, p.87). Significantly, Townsend saw the value in adopting an urbanist or 'spatial' perspective to examine mobile communications practices in relation to "…where people and things are located—and…how space is created and, consequently, how it shapes activity patterns" (p.87).

Townsend's central argument asserted that new mobile communications systems were "rewriting the spatial and temporal constraints of all manner of human

communications" (p.89). He acknowledged that the city had long played a primary role in communications, and that while mobile communications technologies were disruptive they would not necessarily net the significant physical change that had accompanied earlier technological advances such as the automobile (2000, p.89). This early and noteworthy perspective reflects a measured approach that gestures to the ways that the 'spatial' implications of mobile communication technologies would likely be far more complex and contradictory than previous technological developments, and thus more difficult to comprehend.

In contrast to the general perception of the invisibility of ICTs, mobile technology practices are now said to constitute a prominent and so-called 'pervasive' presence in everyday life. This is a significant point of difference from antecedent computing and communications technologies, particularly as the contexts in which mobile technology practices are typically observed to play out are in various kinds of urban public space. In this way mobile technology practices take on both material (corporeal/social) and spatial significance, and in short, they have become 'visible'. This is significant to this thesis as in many ways the visible presence of mobile technology practices in urban public space has contributed to their wider scope as an academic research topic. Relatedly, and as is argued here, the popular acknowledgement, and scholarly assigned status as 'everyday' practices, has equally functioned to validate mobile technology practices as a significant cultural force and thus legitimate subject of study.

Since Townsend's influential observations on mobile communications technologies and urban public space in 2000, there have been several significant technical developments including wireless and mobile internet, Web 2.0 platforms for interactivity—also known as the participatory Web—and the advent of more sophisticated and accurate global positioning systems (GPS). Collectively, these developments have made possible the contemporary smartphone feature of location-awareness, location-based services (LBS), and locative media. Particularly, this has catalysed a new *scale* of thinking around the relationships between technology and urban life. The move from conceptualising the impact of ICTs on cities to the ways that mobile technology practices 'transform' urban public space represents a significant scale shift that makes possible a different range of observations and speculations. Practices of mobile location-awareness have heralded wider research attention to contexts-as-locations or places, rather than seeing context as

simply the frame in which techno-social relations play-out. Furthermore, the individual interpretation and meaning-making processes that mobile location-awareness purportedly make possible have led to far greater speculation on how mobile technology practices affect the way people see and form value-attachments to urban public spaces. Subsequently, mobile location-aware practices have occupied much of the more recent discourse that attests to a transformation in the way people act in, as well as perceive, the built environment. In this way, the rhetoric of transformation has shifted from a city-scale or allocentric perspective (the bird's eye view) to a local-scale/individual or egocentric perspective.

Several scholars have argued that location-awareness allows smartphone users to forge stronger and more meaningful connections to urban space (de Souza e Silva 2006; Bassoli 2007; de Souza e Silva and Frith 2012; O'Hara 2008; Humphreys 2010; Humphreys and Liao 2011; Farman 2012a, 2013; Özkul 2015; Picon 2015). In the case of mobile media theorist Jason Farman, a positive transformative logic pervades his perspective. This is superlatively expressed through his anecdotal observation that "…mobile technologies have reinvigorated our fascination with location and place" (Farman 2012a, p. 19). Architectural scholar Antoine Picon offers a similar sentiment, when he states that despite ICTs having been long associated with a "…sort of annihilation of space", the geo-locative and location-aware possibilities that mobile technology practices afford means they have, "…restored the importance of space" (2015, p. 14). Picon calls this a sort of "return to space", and in ways similar to Farman, effusively expresses how geo-locative features can "…*enhance* physical reality by *enriching* three-dimensional space with contextual electronic content" (2015, p. 15, my emphasis).

Understanding the ways that mobile technology practices have transformed the aesthetic, symbolic, and lived experience of urban public space is an enquiry into everyday life, personal experience, and in short, phenomenological avenues of thinking. Unlike studies that draw heavily on empirically verifiable data to theorise socio-spatial transformation, as for example Manuel Castells (2009) who connects ICTs and the information economy to large-scale socio-spatial change, claims to the transformed experiential *meanings* of urban public space, and to its enhancement, enrichment, enlivenment or activation, enter into an arguably contestable territory. This thesis

proposes that in unfolding the conceptual foundations that underpin how mobile technology practices are reasoned to catalyse the transformed experience, interpretation, and meaning of urban public space, disciplinary differences will be illuminated, and an alternate, critical, and productive discussion around the notions of transformation can follow.

1.2 Research problem context: Disciplinary perspectives

Addressing the interrelationships between mobile technology practices and urban public space enters into a sizeable subject area, not only given the sheer range of technical conditions this can pertain to, but also and relatedly due to the number of scholars that attend to this topic from numerous disciplinary angles as well as technical and conceptual perspectives. Subsequently, the discourse to be examined here extends to disciplines that have not traditionally taken urban public space as their primary focus such as architecture, landscape architecture, and urban studies, collectively referred to here as the built environment traditions. Urban public space as a significant focus of research now features in discourses from computer science and its allied fields such as science and technology studies (STS), and human-computer interaction (HCI), interaction design, and urban informatics, as well as communications and media studies.

For the computer sciences, ubiquitous computing (ubicomp) theory (Weiser 1991; Weiser and Seely-Brown 1996) is foundational to the ways the relationships between computing and urban public space have come to be conceptualised. Broadly speaking, the ubicomp perspective positions cities, and particularly urban public spaces, as key sites to be optimised through the wide distribution and deployment of computing processes. Mobile computing and mobile technology practices differ from the ubicomp vision in several significant ways that will be discussed further, yet are nonetheless widely argued to have realised the objective to distribute computing into everyday contexts. Ubicomp theory is also considered significant to this research as it indicates a motive for the ways research related to mobile technology practices is more often told from the perspective of *positively* augmenting and experientially transforming urban public space.

A tacit assumption of the ubicomp perspective, and indeed an underlying sentiment of the recent technourban imaginary[2] of the 'smart city' is that urban public space—as an urban and architectural project—is insufficient or has failed (Koolhaas 2015). This assumption echoes the popular postmodern contention of a public space crisis that argued that the heavy arm of capitalist logic would eradicate public space both physically and conceptually. In this earlier discourse, many scholars argued that allowing private corporations to own and manage 'public space' thus weakened their legitimacy as 'truly' public. The issue of contemporary technologies factored in to these crisis scenarios in two dominant ways. On the one hand ICTs were characterised as invisible mechanisms for the management and surveillance of privatised-public spaces, and on the other they were cast as a new means of electronic communication that afforded 'teleworking' at-a-distance that would thereby draw people away from urban centres and thus public space. Thus, the postmodern crisis of public space represents a technourban imaginary that, in a technologically determinist fashion, held certain technologies accountable for the demise or elevation of urban conditions. In the context of this research, discussing the postmodern crisis of public space is argued to provide a useful way to explicate the normative and nostalgic assumptions that inform its contemporary representations and subsequently claims to its so-called transformation.

More recently, and in contradistinction to the aforementioned postmodern predictions of crisis, high numbers of people have returned to city centres in ways that have reilluminated cities as significant engines of economic growth and urban public spaces as the predominant stage for the playing out of public life. Still, a legacy of the postmodern public space crisis has been, from the turn of the millennium onwards, the elevation of particularly nostalgic perspectives of *ur*-public space, as for example embodied in the Charter for the New Urbanism (CNU) (1999) and jargonised 'placemaking' trends that typically draw from the thinking of urbanists such as Jane Jacobs (1992), William H. Whyte (1980)[3], and Jan Gehl (2001). The communitarian themes of the CNU, and placemaking rhetoric is equally echoed in the many ways that contemporary technology design is newly imagined for cities. In particular, the

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[2] Martijn de Waal (2011a) defines the "technourban imaginary" as the confluence of the technological imaginary with the urban imaginary (p.5-7). He argues that "the technourban imaginary is shaped around both ideas of wat city is…as well as around urban ideals" (2011a p.7).

[3] The Project for Public Places http://www.pps.org/

discursive narratives around mobile technology practices often point to how their interactional opportunities offer ways to enrich, enliven, enhance, and in some cases, restore urban public space, over alternate perspectives that see mobile technology practices as barriers to engagement and as new modes of consumption. These perspectives often rest on both selective and conflated interpretations of the roles and value of urban public space. The various ways public space is conceptualised, represented, and in many ways 'produced' in and through scholarly discourse is further explored in Chapter 3.

1.3 Research problem context: Thinking technology

Historically, the subject of technology in relation to the built environment, or as Anthony Vidler (1999) states, "the question of technology and the problem of space", has been far from under-examined (p. 483). Yet, within the built environment traditions, and particularly in the discipline of architecture, questions of technology have largely favoured instrumental and tectonic perspectives. The instrumental perspective understands technology as a tool in a process. In architecture, this positions technologies as software and hardware employed in the representation and production of design, while the tectonic perspective interprets technology in terms of building construction and its performance. While a large body of discourse has explored the instrumentality of various ICTs in the design practice, such as the use of computer-aided design software (CAD), and more recently processes of digital fabrication, speculation on the everyday, and the ontological and epistemological impacts of ICTs, that is, on social practices and ways of being and knowing, has been largely unattended to in urban and architectural discourse.

Where urban and architectural scholars have departed from instrumental perspectives of technology to debate the potential impacts of ICTs, as for example in the early 1990s, the resulting narratives have tended to skirt between the extremes of technophilic and technophobic prediction and anti-urban sentiment (Graham 2004a). Much early discourse framed ICTs in terms of 'cyberspaces' and 'digital cities', yet understood these as principally virtual phenomena, characterised as cleaved from actual physical space, and constituted by virtual or online communities and activities. The prominent architect and scholar William J. Mitchell initially described the internet as

"fundamentally and profoundly *antispatial*" (1995, p.8). Still, for a great many others ICTs were simply cast as extraneous to the concerns of the built environment. Moreover, the tendency for the built environment disciplines to conceive of spaces and places in typically quantifiable and physical-material terms has tended to obscure the growing cultural force that digital technologies and their associated practices represent. The divergences and similarities in disciplinary approaches to thinking technology is considered foundational to appreciating contemporary claims to the transformation of urban public space and is further discussed in chapter 3.

1.4 Research problem context: Digital culture and its discontents

Disciplinary differences go some way to explaining why, despite the internet's mainstream adoption[4] in the 1990s, the relationship of ICTs to physical spaces and places has been thinly conceptualised in the built environment traditions (Graham and Marvin 1996; Mitchell 2003; McCullough 2007, 2013; Aurigi 2008; Forlano 2008, 2009b; Hill 2014; Picon 2010, 2015; Luque-Ayala and Marvin 2015).[5] Architect and scholar Malcolm McCullough is particularly outspoken on architecture's curious indifference to the wider conditions of digital culture. To this end, he has previously argued that "Architecture needs to rejuvenate itself with interaction design" (McCullough 2007, p.395). Popular commentator Dan Hill spins a far more provocative view, offering that "[m]uch traditional architecture is no longer necessary. The city is built. The western city, at least…the city is [now] altered through software" (2014, p.6). Hill further asks, what does architecture now do if the 'meaningful' changes to the city don't rely on its traditional role of shaping the built environment? (2014, p.6).

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[4] While working for the European Organisation for Nuclear Research (CERN) Tim Berners Lee realised that networked systems for communication and information exchange that had existed in military and university contexts since the 1960s, and commercial contexts since the 1980s, could be developed at a global scale. He subsequently conceptualised a global information system, and developed a web browsing software called the World Wide Web (WWW) documented in a proposal dated March 12th 1989. In December 1990 he finished the first 'website' and reported it in alt.hypertext on August 7th 1991. Introduced in 1993, Mosaic became the first generation Internet browser to be freely available and accessible to the public (Ryan 2011). The 'mainstreamisation' of the Internet is considered here to have commenced at this time.

[5] More specifically, and by contrast, Stephen Graham argued in 2004 that the relationships between the production of *new media* and the changing nature of urban places and life has been well-addressed empirically and theoretically by a number of disciplines since the early 2000s (p.17).

While these statements may appear sensational, nonetheless, if the growing significance of digital technologies—of ICTs and moreover mobile technology practices—in relation to the production of urban public space remains overlooked in the built environment traditions, there are many other research communities that are more than willing to step in and fill the void. Prominent urban scholar Jon Lang (1994) has previously offered that urban design should adopt an "environmentally benign position" that 'leaves room' for change and does not assume technology will always find an answer (quoted in Carmona 2003, p.45). While it is common sense to recognise that technological developments often cycle through rapid change, this does not exclude them from being socio-culturally significant, but overlooking their significance does remove the opportunity for the built environment traditions to offer much-needed critical scrutiny.

The tendency to cleave matters of everyday technology from the issues and examination of the built environment remains tellingly reflected in a number of very recent publications. This includes for example a 2015 study of urban public/private interface types to explore "how private territories plug into public networks", that focuses exclusively on built (material) interfaces and legal cadastral boundaries (Dovey and Wood 2015, p. 1). In the book publication *Urban Squares as places, links and displays* (Lang and Marshall 2017) little reference is made to digital technologies or digital culture. Where digital technologies are discussed they are afforded scant attention. The implications here are that technology use in urban public space is a matter to be addressed elsewhere in, for example, the social and cultural sciences, and, given it is undergoing such rapid and ongoing change, intellectual investigation is futile. Lang and Marshall (2017) write that,

> *"[i]n this digital age, ways of life and experiencing 'the urban' are changing. Most communication is facilitated through electronic media…and takes place on portable, personal devices…Despite all these changes, many patterns of behaviour have remained remarkably consistent" (p.50).*

This sits in stark contrast to many alternate perspectives, such as those of Michael Batty (2013) who argues that "[C]ities are changing radically as the 'disconnect' between their physical reality and the activities that define them draw apart. What goes on in cities in increasingly virtual…" (p.762). Furthermore, Rowan Wilken and Gerrard Goggin (2012) argue for the necessity to "develop a fuller, critical understanding of the

intersections and interconnections between mobile technology use and notions of place…" (p.18). Most recently, the publication *Architecture and interaction: Human computer interaction in space and place* makes the case that there is much to be gained from developing approaches that knit the research communities of computer science and the built environment traditions more closely together (Dalton et al. 2016, p.5).

In contrast to the largely instrumental interpretation of digital culture in the built environment traditions, new thinking around the contexts of computing is often said to have affected a 'spatial turn' in computer science, STS, HCI, communications and media studies, as well as newer fields such as interaction design (Moggridge 2007) and the assertive field of urban informatics (Foth 2009; Foth et al. 2011a). For the more established disciplines, such as computer science and HCI, bringing together the once distinct conceptual realms of technology, information, and space, has meant shifts in disciplinary approaches, research subjects, methodologies, and theoretical perspectives. The conceptual coupling of physical context—or urban and architectural space—with ICTs is most notably reflected in the paradigmatic concept of 'ubiquitous computing' (ubicomp). Ubicomp is largely attributed to computer scientist Mark Weiser and his Xerox Palo Alto Research Centre (PARC) colleagues who explored alternate contexts for computing from the 1980s onwards (Weiser 1991; Weiser and Seely-Brown 1996).

The ubicomp paradigm defines a key shift in computer science thinking away from conceiving of the computing interface in terms of a human-computer-interaction, and towards the notion of context or environment-based interactions. Broadly defined, the ubicomp paradigm "proposes a digital future in which computation is embedded into the fabric of the world around us" (Dourish 2004, p. 19). Ubicomp envisioned a variety of ways to extend and distribute computing into physical space, and to weave "networked information technology into the places and activities of daily life" (Agre 2001 p.178). As Paul Dourish and Genevieve Bell (2007) have well noted, the ubicomp paradigm departed from existing computer science research approaches in three key ways. Firstly, rather than addressing a pre-defined problem ubicomp was largely predicated on "future envisionment" (Dourish and Bell 2007, p. 143). Secondly, rather than concentrating on discrete technologies ubicomp proposed an ensemble of many disparate computational elements. Thirdly, while ubicomp thinking proposed strategies

to embed a host of ICTs into objects, contexts and everyday practices, it purportedly re-framed the problem definition as social rather than technical.

In the social and cultural sciences, the impact of digital technologies has been widely explored in relation to new 'networked' social structures and configuration. Much of this research initially focused on networked 'communities' facilitated through modes of online communication, broadly referred to as Internet Studies (Rheingold 1993; Wellman 2002). Similarly, communications and media studies scholars initially focused on the ways new online platforms were producing new forms of media, or 'new media' (Manovich 2001). Following the turn of the new millennium the growing mobilisation of various digital technologies allowed mobile access to the internet in a range of places, and resultantly, still newer forms of mobile (new) media. With this mobilisation it became increasingly apparent that the internet—commonly considered a space of 'immaterial' digital information flows—was not simply a realm apart from the physical world, but rather one increasingly and complexly embedded within it (Agre 2004, p.415). Subsequently, many scholars in the social and cultural sciences and Communication and Media studies also turned their attention towards the new contexts of digital information, communication, generation and exchange as mediated through mobile networked devices in urban public spaces. Further still, with the release of the Apple iPhone in 2007 and its rapid global uptake, mobile access to information combined with new geo-locational features meant various scholars became more attuned to the significance of physical contexts, and namely urban public space, in the organisation of online cultures and the production of new media. A corollary to this shift has been the far wider speculation on how mobile technology practices and new media transform the built environment, that is, on how cities and their spaces respond and adapt to new informational systems and socio-digital practices.

While a 'spatial turn' is alleged to have taken place in computer science, the cultural and social sciences and communications and media studies, the 'digital turn' in the built environment tradition should not be understood as the reverse position. For Mario Carpo (2013) the digital turn in architecture describes the moment when digital technologies entered mainstream architectural practice as vehicles and tools of representation and more formalised design methods (2013, p.9). In this way, the digital turn refers to a normalisation of digital design practices, and does not necessarily extend

to a wider interpretation of digital culture that attends to considerations of the role technologies do and can play in everyday life and how designers might account for this.

A range of architectural scholars such as M. Christine Boyer (1992a, 1996, 2006), William J. Mitchell (1995, 1999, 2000, 2003, 2005), Richard Coyne (1999, 2010), Neal Leach (2002a, 2015), Malcolm McCullough (2004, 2007, 2008, 2010, 2013), Sanford Kwinter (2008), Mark Shepard (2011, 2014), Kazy Varnelis (2012), Mario Carpo (2013a; 2013b), and Antoine Picon (2010, 2015) have waded into wider considerations of digital culture in relation to architecture and urbanism. These scholars are significant to this thesis as they write from positions within the built environment traditions yet in ways that take account of the radically evolving landscape of digital technologies and practices. Many of these scholars have adopted a critical approach, in particular Boyer on the technourban imaginary and new media, and also Coyne on digital narratives who has argued that even William J. Mitchell's perspective over effusively "effects a ready transition to the future" (1999, p.19). This thesis argues that there is further and necessary scope to add to this range of perspectives in ways that more specifically and critically address the relationships between contemporary mobile technology practices and urban public space. To adopt a critical approach necessarily entails exploring beyond disciplinary limits and this can offer productive opportunities. As Jane Rendell (2013) suggests, by thinking between and at the edge of the architectural discipline, there is opportunity to return to it with thinking that is not only 'transformed', but perhaps is also capable of being transformational.

1.5 Research problem context: Mobile technology practices and the 'smart city'

The tone of much contemporary discourse around mobile technology practices tends towards technological promise and optimism. This is further evinced in the many examples of corporate tech projects and government city policy that from the mid 2000s onwards have advanced the rhetoric of a smart city. The vision and concepts of the smart city are considered relevant to this thesis insomuch as mobile digital devices—and particularly the smartphone—figure centrally to the delivery schema of smart initiatives. As Martijn de Waal writes, in the smart city scenario "the smartphone becomes an intelligent compass, guiding the city dweller through the bustle and chaos of everyday life" (2014, p.9). While the smart city is not a primary focus of this thesis

and its burgeoning discourse cannot be deeply explored here, a growing body of smart city critics provide valuable cues for thinking critically about claims that mobile technology practices are transforming urban public space.

Cities, objects, and people, have long been targets for technological applications and experimentation, and it is reasonable to expect that the prevailing discourse on mobile technology practices should be generated by those seeking to derive positive outcomes from actively experimenting with and applying these technologies. As Amy Glasmeier and Susan Christopherson (2015) note "[a]cademics are attracted to technology...They are drawn by the potential that these applications offer to *remediate* urban problems such as snarled traffic, the lack of parking spaces, and inefficient energy use and waste disposal" (2015, p.4, my emphasis). The smart city is a primary technourban imaginary currently promoted by businesses and governments alike, locally and internationally, as a strategy to *fix* urban problems through the application of various networked digital technologies. While the smart city thinks big, and is chiefly imagined in terms of large-scale ICT systems that hinge on the collection of real-time and so-called 'big-data', mobile technology practices figure centrally to smart initiatives in two key ways. Firstly, they represent the opportunity to track and collect large amounts of data about the ways people move through urban space, what they see and pay attention to, and how they feel about it; and secondly this requires little infrastructural investment as it capitalises on an existing networked platform to collect the data and also deliver a range of 'smart' services.

Smartening up our cities, so the rhetoric goes, promises to deliver 'sustainable', 'efficient', 'secure', 'liveable', and 'equitable' outcomes. Overwhelmingly the bulk of smart city discourse remains focused at this big-picture scale; it is visionary, numbers focused, and gives emphasis to the ways big-data can facilitate city-scale optimisation strategies, including infrastructure management such as road traffic, public transport, and waste services. Yet, what the smart city rhetoric typically overlooks are the human-scale implications of its proposed technological systems, that is, its users and the user-experience. While the 'user', 'citizen' or 'publics' are certainly not absent in smart city accounts, reference to these terms is typically made in the context of generalised notions of participation, and in ways that embody a kind of abstract and empty quality (Rose

2015). This represents a significant oversight, as Gillian Rose points out, given the "genealogy of the 'user'" is in reality far more diverse (2015).

A growing body of critical literature has responded to the smart city's relentless focus on technicity, IT infrastructure and big-data (Hollands 2008; Allwinkle and Cruickshank 2011; de Lange and de Waal 2013; Greenfield 2013; Glasmeier and Christopherson 2015; Kitchin 2015; Rose 2015; Luque-Ayala and Marvin 2016; Moritz 2016). A primary theme of this discourse is 'the right to the smart city' that advances alternate models of smartness that are typically described as bottom-up and/or citizen-led (Foth et al. 2011; Greenfield 2013; Hill 2014; Townsend 2013; Vanolo 2014; Ratti 2016; Foth 2016). Such approaches lend emphasis to the smaller-scale workings of the city and to ways of utilizing technologies to shift 'control' *back* into the hands of citizens. While these approaches are valuable, they do not necessarily address the experiential aspects of smart initiatives.

Like the ubicomp paradigm that preceded it, the smart city polemic is currently more visionary than real, yet the power of this imaginary should not be underestimated (Boyer 1992a, 1992b, 1996). As Picon (2015) reflects the smart city rhetoric largely operates as a self-fulfilling prophecy, "the accounts that are written…generate the conditions that make them feasible" (p.13). Given this, Luque-Ayala and Marvin (2015) issue an urgent call to critically engage with the implications of smart technologies and with the questions of why, how, and for whom these technologies are set to benefit. They further argue, that problematically "we lack the theoretical insight and empirical evidence required to assess the implications of this potentially transformative phenomenon" (p.2106). The research examples that focus more specifically on mobile technology practices as surveyed in this thesis goes some-way towards addressing this gap. Still, the key contention of this thesis is that much of this discourse leans towards technological opportunism and determinism over critical insight. The nature and extent to which mobile technology practices constitute a transformative impact for urban public space, and the ways this can be alternatively understood and theorised is the primary research enquiry that this thesis takes up.

1.6 Research Questions

With the issues set out by the research problem context in mind, this thesis poses the following research questions:

1. How is the notion of 'transformation' represented in scholarly discourse that addresses the interrelationships between mobile technology practices and urban public space?
   1.1 In what ways do disciplinary frameworks of thinking and normative conceptual models influence how the interrelationships between mobile technology practices and urban public space are represented?
2. What roles are mobile technology practices alleged to have played in the so-called 'transformation' of urban public space?
3. In what ways has, and further can, this so-called transformation of urban pubic space be alternately theorised?

To address these questions, this thesis explores the discursive constructions that connect mobile technology practices to not only 'new' conceptualisations of urban public space, but more specifically its *positive* restoration. As, while it might be reasonable to accept that new technologies beget new ways of seeing as others such as Walter Benjamin (1968; 2008) have historically argued, claims that centralise mobile digital technologies as a force of *positive* transformation for urban public space warrant further critical examination. This thesis seeks to In refracting this topic through the theoretical lenses of liminality (Turner 1967, 1974a, 1974b, 1977a, 1977b, 1982, 1985)—a theory concerned with processual transformation—the intention is to construct an alternate, and ultimately critical perspective.

1.7 Methodology: Interdisciplinarity as working between

The terms interdisciplinary, transdisciplinary, and multidisciplinary are often used interchangeably and their distinctions can be unclear. Jane Rendell (2013) provides not only clarification here, but also an energising interpretation of interdisciplinarity as a critical approach. Following Homi Bhaba's (2012) discussion of interdisciplinarity as a discipline's point of liminality, and Julia Kristeva's (1998) notion of the "diagonal axis", she argues that the distinction between these prefixes lies in the opportunities for

interacting with disciplinary knowledge in different, and moreover questing ways (Rendell 2013, p.129). From this perspective, multidisciplinarity refers to the inclusion of various forms of disciplinary knowledge yet in ways that retain its disciplinary distinctiveness. By contrast, interdisciplinary refers to the cross-fertilisation of disciplinary knowledge, methodologies, and terminologies, in ways that call into question normative processes, thinking, and modes of working (Rendell 2013). Rendell describes this as a mode of working between and at the edge of one's discipline (2013, p.129).

The advantages of interdisciplinarity, particularly for the architectural discipline, are liminal in logic. Extending beyond one's own disciplinary bounds, and bringing other disciplinary concepts to bear on thinking and vice versa allows, as Rendell reflects, "travelling concepts…to challenge assumptions internal to disciplines…" (2005, p.261). In this way, to experience ideas from 'other' contexts, is not to displace the value of disciplinary thinking, but rather is to opportunistically think at the edge or outside of it, and to return to it as productively transformed. In this thesis, an interdisciplinary mode of thinking is undertaken in several ways. Firstly, it deals with the subject of technology from a philological perspective, that is, it asks questions about what new technologies might mean for urban culture and everyday life; secondly this thesis engages the theoretical lens of liminality, originally developed in the discipline of anthropology, as an interpretive framework to examine, critique, and explore the discourses that connect mobile technology practices with urban public space. Thirdly, as a genealogy-orientated examination of the body of discourse on mobile technology practices and their interrelationships to urban public space, the sources of 'data' to be examined here are necessarily drawn from several key fields.

Adopting liminal theory as an interpretive framework provides an alternate way to select, examine, and critique the representation of the relationships between urban public space and contemporary mobile technology practices across disciplinary discourses. Significantly, this is not a thesis *about* liminality—although its conceptual interpretations are broadly traced in chapter 2—and nor is it an application of liminal theory in the anthropological or ethnological sense of fieldwork. Rather, as a proven interdisciplinary and cross-scalar concept, liminal theory operates here as a useful

scaffold for thinking through notions of transformation at the scale of the technourban imaginary as well as the individual scale.

1.8 Thesis scope and limitations

This thesis argues that the notion that mobile technologies practices have transformed public space is a generalizing statement that is exceedingly dependent on a complex range of technical, socio-economic, and cultural variables that are difficult to measure. Subsequently, this thesis focuses on developing a critical conceptual framework, and namely the anthropological conceptual notion of liminality, for engaging the discourses on mobile technology practices and their attendant claims to the transformation of public space. The selected discourses range from the mid-twentieth century through to the present, with primary attention to North American and Western European contexts where information and communications technologies (ICT), and mobile information and communications technologies (mICT), were largely developed and initially researched. The selected discourses are those that simultaneously invoke concerns with urbanism, space, and technology, as they relate to notions of urban 'transformation'. Given these overlapping foci, the selected discourse is drawn from numerous and diverse disciplinary fields including architecture, urban studies, geography, sociology, cultural studies, communications and media studies, as well as computer science. Additionally, and relevant to the particular disciplinary approaches of each of these fields, references are made to European philosophical material including key figures such as Deleuze and Guattari (1984, 1987), Martin Heidegger (1977), Jean Baudrillard (2006), Paul Virilio (1991, 1994, 1997), Jürgen Habermas (1991), and Don Ihde (1993).

Given this research transgresses multiple concepts and disciplinary fields, the breadth of discourse to be examined necessarily poses limits. Each of the disciplinary fields that address the intersection of urbanism, space, and technology in the context of urban transformation have an extensive body of knowledge that is also subject to internal contestation. While attention has been given to the ways these diverse fields deal with similar subjects through their own disciplinary frameworks, and a range of discourses have been examined in depth, the complex debates within each discipline cannot be fully elaborated on here. Furthermore, as this research is undertaken by an architect, it adopts an architect's particular perspective. Consequently, the examination of

discourses in this thesis precedes from a position of seeking to understand their relationship to, and value proposition for, the architectural discipline.

Finally, conducting research on contemporary technology is particularly vulnerable to its own innovation and production cycle, that is, the 'latest' technology, and by extension its associated practices, can swiftly become superseded and outdated. This, as Goggin et al. (2015) identify, makes mobile technology-related research in itself "a moving target" (p.7). This can be problematic when coupled with the typical time-lag associated with the academic publication cycle. In this thesis, for example, this has meant that considerable attention is directed towards scholarly user-studies on mobile social gaming applications that were available during the research, over more recent location-aware services such as Uber and AirBnB that have been subject to significant attention in popular media. On the other hand, the growing diversity of disciplinary interest in mobile technology studies more generally has equally meant the opposite challenge of managing ever-more potentially relevant perspectives.

1.9 Thesis impact

The discourse examined in this thesis points to a significant investment in researching the interrelationships between emerging digital technologies and the built environment from within the social, cultural, and computer sciences, whereas a limited contribution from the architectural discipline. As a contribution to interdisciplinary thinking the value of this thesis to the architectural discipline is thereby in its presentation of alternate disciplinary perspectives that 'make visible' the often-abstract impacts of mobile technology practices on and within urban public space in ways that traditional cartographic methods and tools cannot. With an eye to the current technourban imaginary and policy vehicle of the smart city, it is the contention of this thesis that as a discipline that is both systems orientated and details focused, architecture is uniquely positioned to offer much-needed critique on the relationships between emerging technologies and the built environment. Accordingly, the range of disciplinary perspectives, together with the critical analytical framework of liminal theory adopted in this thesis, point to new and alternate epistemologies and methods that can enable the architectural discipline to not simply comprehend, but actively engage in critical

dialogues on contemporary and emerging technologies for and within the built environment.

1.10 Chapter outlines

This chapter has set out the trajectories that guide this investigation, their relevance, and the research problematic that they establish. This has outlined how architecture as a tradition militates against the recognition of process-based phenomena and tends towards an instrumental view of technology, while the pervasiveness of mobile digital technology use in the urban realm has spurred a new range of disciplinary interest in matters of the built environment and public space. Particularly this calls into question how the relationships between public space and mobile technology practices have been represented in scholarly discourse with a particularly focus on claims pertaining to the transformation of public space.

This thesis adopts the anthropological notion of liminality as a critical theoretical framework through which the key themes and selected discourses related to the transformative power of mobile technologies in urban settings are to be examined. Consequently, the organisation of this thesis places the discussion and examination of liminal theory following this introductory chapter. Chapter 2 introduces liminal theory and the notion of liminality as a framework through which the thesis proposition is to be examined. Liminal theory has rich theoretical significance and necessarily this chapter begins with a discussion of its popular origins in anthropology, ethnologic theory, and cultural studies. This chapter examines the utility of liminal theory as it has been applied in a range of disciplinary contexts from cultural studies, human geography, architecture and urban sociology and examples to consider what kinds of things, conditions, actions, subjects, and thus ‘spaces’ are deemed ‘liminal’ and why? This further asks what is meant by ‘liminal space’ across multiple disciplinary contexts, and in what way(s) liminal theory and the notion of liminality might be applied to further understand contemporary urban conditions?

Following Chapter 2 the central chapters of the thesis unpack core concepts including ‘public space’ (chapter 3), ‘technology’ (chapter 4), and the ‘everyday’ (chapter 5). The notion of liminality is understood in these chapters as a process of revealing the assumptions at work in their various discursive and disciplinary representations. The

ways these concepts are invoked and potentially reframed within a range of more recent discourse pertaining to mobile technology practices is then discussed in chapter 6 and chapter 7. More specifically, chapter 7 identifies extant theories of space that attend to both the digital and the 'real' and their interrelationships and closes with an alternate theorisation of urban liminalities.

This thesis is an exploratory work, and it sets out to navigate a large interdisciplinary terrain in order to reappraise the relationships between mobile technology practices and urban public space through the notion of liminality and its particular interpretation of transformation. Time and again, the role of theory is highlighted as necessary to ways of thinking differently in architecture (Smith 2003; Rendell 2013) and to explicating the opportunities of contemporary digital technologies in and for the built environment in both research and practice contexts (Gunkel 2001; Batty 2013; Leach 2015; Luque-Ayala and Marvin 2015; Walliss and Rahmann 2016). Liminal theory, and the notion of liminality as a more nuanced interpretation of the process of transformation, functions here to problematize and critique those technourban imaginaries that centralise mobile technology practices as primary affecting agents of a positive and progressive urban transformation by unpacking generalisations and re-theorising the material and immaterial complexities and contradictions of urban public space.

Chapter 2: Liminal Theoretical Frameworks

> *"...for me the essence of liminality is to be found in its release from normal constraints, making possible the deconstruction of the "uninteresting" constructions of common sense..." (Turner 1977b, p.68).*

In this thesis liminal theory is taken up as an alternate way to call into question the so-called transformation of urban public space in relation to mobile technology practices. In recasting these claims through the lens of liminal theory—one that has much to say on the concept and processes of transformation—yet based initially on tribal ritual observations made by anthropologist Victor Turner (1967, 1977a, 1996), this thesis offers an alternate interpretation of the relationships between mobile technology practices and urban public space. This chapter sets out the origins of liminality in anthropology and ethnologic theory, its modernisation as liminal theory, and traces its arguably demonstrable extensibility to a wide-range of contemporary conditions and scales as reflected in a diverse range of case examples from architecture and urban studies, cultural studies, geography, geo-political studies, tourism, medicine, psychology, and education. This chapter sets out how liminal theory informs the critical framework adopted in this thesis to evaluate the selected urban, architectural, and cultural discourses that address the overlapping foci of urbanism, space and technology in the context of urban transformation. A liminal theoretical framework is argued here to open up to a different set of questions around the transformation of urban public space as mediated through mobile technology practices by unpacking the notion of transformation itself through Turner's concept of liminal and liminoid.

2.1 Thinking through liminality

Adopting a liminal theoretical framework operates to establish an alternate, and moreover, critical perspective, on the representation of the relationships between urban public space and contemporary mobile technology practices. This thesis contends that when brought together and refracted through a liminal lens that the 'transformative' relationships between mobile technology practices and urban public space can be alternatively cast as urban liminalities. The corollary of engaging and adapting a liminal theoretical gaze here is the problematisation of liminal space itself, and a further contribution to its history and methodological range.

In conversational usage the term 'liminal' is often adopted as an adjective to describe 'in-between' conditions, and in this way its clear and uncontested meaning is assumed. Similarly, in urban and architectural discourse, the phrase 'liminal space' more often refers to a physical space that bridges between other spaces and is akin to a threshold.

Thus, the notion of liminal in this disciplinary context often closely aligns with its etymological origins. Still, in other instances the notion of liminal space is offered as a way to describe spaces and places that evade clear or consistent definition, are subject to change, are in states of flux, or are indeterminately temporary (Pieris 2015). Paradoxically, and as will be further outlined in this chapter, the assignation of space as liminal often intends to rectify its apparent ambiguity, or 'otherness', such as where a space may not be commonly recognised as a particular type, or an assumed definition, institutionally or otherwise. Often, what is deemed liminal then becomes not only a matter of categorisation, but also legitimisation.

In broader academic contexts, and particularly in the cultural and social sciences, the concept of liminal space, and of 'liminality', since the latter half of the twentieth century, has operated productively as an adaptable conceptual tool. Across a wide range of disciplines, contemporary academics continue to apply and build on Turner's initial identification of liminal conditions in tribal ritual contexts and conditions of the Western industrialised world. The many ways that liminal theory has been reinterpreted has meant the notion of liminal space has assumed various guises, including as concrete places, performed or enacted practices, and as an experienced state-of-mind. Liminality's apparent temporal elasticity has equally meant it has found reference in relation to moments, periods, and epochs.

In the many case examples reviewed, liminal theory is taken up in an alternate discipline from its origins as a way to frame things, situations, conditions, and subjects, from an alternate perspective. This research adopts liminal theory as a way to establish an alternate, and moreover critical perspective, on the 'transformative' relationships between the representation and experience of urban public space and mobile technology practices. A range of academic discourse has to date separately framed each of these subjects in liminal terms. From an architecture and urbanism perspective liminality is often ascribed to types of spaces and/or specific places. Architectural scholar Quentin Stevens (2004; 2007) has written extensively on urban thresholds in public space as material sites for liminal experience. Karen Franck and Quentin Stevens (2007) have further described a general looseness and "liminality of public spaces" (p.170). Chiara Briganti and Kathy Mezei (2012) dedicate an entire chapter in their edited publication *The Domestic Space Reader* to liminal spaces, categorising a range of spatialities as

liminal, including gardens, porches, passenger ship cabins, bridges, doors, and windows. In a more specific manner, Maureen Heyns (2008) describes Spitalfields in London as an ambivalent liminal space of "shifting boundaries and contested identities, balancing in between margin and centre, exclusion and inclusion, deprivation and regeneration" (p.227).

From a socio-spatial perspective, Jason Prior and Carole M. Cusack (2008) have described gay bathhouses in twentieth-century Western cities as liminal sites, and Kim Dovey has referred to drug use practices in the laneways of Melbourne, Australia, as producing liminal places (2010, p.139). Scott McQuire has referred to the historic figure of the flâneur as having a liminal quality that allows him to "…make visible the politics of the new public spaces" (2008, p.6). Elsewhere, Michiel Dehaene and Lieven de Cauter (2008) as well as James D. Faubion (2008) draw clear parallels between Foucault's (1986) heterotopian spaces and Turnerian liminality. More recently, Taien Ng-Chan (2015) has described both urban public transport environments such as bus stops and train stations, but also the practice of commuting, as liminal space.

In earlier examples, and from an urban sociological perspective, Sharon Zukin (1991) adopted liminal theory as a way to explain the conditions of late-capitalism, and the ways they manifested in urban and architectural forms. In the same year Rob Shields (1991) utilised liminal theory to re-examine a range of geographies and practices associated with leisure and those that mark a change in status or stand apart from everyday routines. More recently, and from a social science perspective, Hazel Andrews and Les Roberts (2010; 2012) identify liminal qualities in the UK coastal resort town of Margate, also related to notions of holidaying and the permissibility of out-of-character behaviours. Geographies that negotiate ecological conditions such as beaches, wetlands, estuaries and mires, have been popularly discussed in liminal terms by a number of scholars (Meethan 2012; Roberts 2012).

A review of recent discourse relating to mobile digital technologies finds both explicit and implicit references to liminal conditions. In the broader sense of internet access, digital information flows, and notions of cyberspace, Rob Shields (2003) associates virtual space with liminality in the ways the virtual is always in a state of becoming. Yet, significantly, Shields argued that interpretations of virtual space such as "…the

Web, vacation resorts, theme park environments…specific holidays and events" are examples of 'liminoid' spaces, as they are temporary and often commodified experiences (2003, p.13). More recently, and with relation to mobile digital technologies, Science and Technology Studies (STS) scholar Sherry Turkle (2008) has described how "[t]he self, attached to its devices, occupies a liminal space *between* the physical real and its digital lives on multiple screens" (p.122, my emphasis). The condition invoked here is one of being simultaneously in two spaces at once—an actual and a virtual space. Also implied is the sense of a manifold space comprised of both physical and digital layers, where being tethered to a digital device facilitates a rapid switching between. Unlike Shields reflection on early internet use at the turn of the millennium, Turkle's more recent theorisation attaches much more significance to people's relationship to digital technologies. A range of scholars have theorised how mobile digital technology engagement affects the production of new and different 'spaces'. Like Turkle, several scholars argue that the medium, or interface, and the media of mobile digital technologies figure centrally in the production of new *hybridised* spatial conditions, such as "recombinant space" (Mitchell 1995, 1999, 2003, 2005), "augmented space" (Manovich 2001, 2006), and "hybrid space" (Sheller and Urry 2003, 2006b; de Souza e Silva 2006; Kluitenberg 2006; de Souza e Silva and Sheller 2015; Willis 2016).

This chapter will further examine the utility of liminal theory in a range of examples to consider what kinds of things, conditions, actions, subjects, and thus 'spaces' are deemed 'liminal' and why? This will explore the various ways liminality has been identified, ascribed, and explained, and the methodological and epistemic roles it has played, and moreover, can potentially assume. In calling into question what is meant by 'liminal space' across multiple disciplinary contexts, this seeks to address the value of adopting a liminal gaze, asking what is gained, or indeed lost? More specifically, this asks in what way(s) liminal theory might be applied to further understand contemporary urban conditions. How might such an approach instructively expand our spatial sensibilities? Significantly, this is not simply a question of semantic clarification, but rather an opportunity to explore the limits and extensibility of a theory in order to understand the potential for its productive application for this thesis. Ultimately, this points to a methodology by which the overarching aim of this thesis—to explore, and offer an alternate perspective on the relationships between urban public space and

contemporary mobile digital technology—can be framed. By refracting this topic through the lens of liminal theory it is intended that an alternate and critical perspective can be proffered.

Liminality has rich theoretical significance and necessarily this chapter begins with a discussion of its popular origins in anthropology, ethnologic theory, and cultural studies. While an exhaustive review of the many academic examples that adopt liminality lies beyond the scope of this research, key examples will be considered here. This includes examples from architecture and urbanism, geography, medicine, politics and theology, as well as fields of study including feminist theory, literary studies, and post colonialism, and more recent references found in STS and in relation to mobile digital technology practices.

2.2 Liminal origins

Conceptually, liminality has been popularly equated with notions of in-between-ness, indeterminacy, ambiguity, multiplicity, transgression, and transformation. These characteristics are argued to have influenced its wide appeal from the second half of the twentieth century onwards. Whereas modernity preserved conventional and static dualisms through definition, logic and reason, postmodern thinking has been characterised by the rallying against totalities to offer diversity, multiplicity, plurality, and indeterminacy. For many scholars wanting to question normative standards or belief systems, or those seeking to give voice to under-represented subjects or situations that fell between the cracks of conventional understanding, liminal thinking offered a new way to write from an alternate position. As Bjorn Thomassen (2009) describes "[t]o write from the interstices, from the in-between" became a common strategy in postmodern or postcolonial literature (p.18).

Given its popularity as a framework to foreground notions of difference and otherness in postmodern discourse, the concept of liminality, and liminal conditions, have predominantly *positive* associations. In this context, assigning a condition, place, person or group liminal status operated as a conceptual device to elevate the "interstitial position between fixed identifications" (Thomassen 2009, p.18). The tendency for more contemporary adoptions of liminality to favour a positive interpretation, sits at odds with the way Turner saw the liminal as that which transcends notions of value in a

positive or negative sense. For Turner, liminality was not a heuristic device, but rather a 'true' description of being (St John 1999, p. 1). Yet, as with many concepts that travel, liminality now assumes a range of interpretations and applications. The ways contemporary appropriations of the liminal align to, or depart from, Turner's original theorisation is a significant subject, and is one that has been comprehensively addressed in a range of academic scholarship (St John 1999, Thomassen 2009, 2012; Andrews and Roberts 2012). While the matter of theoretical displacement is certainly taken into consideration here, of greater importance to this thesis are the ways, from a liminal position, it might be possible to unfold alternate perspectives on the relationships between mobile technology practices and the representations as well as experience of urban public space. And in this sense it is necessary to understand through case examples, what the liminal is conceptually 'capable' of.

2.3 First-order liminality: A universal theory

It is widely accepted that the liminal phase and liminal theorisation has come to prominence in social and cultural theory chiefly through the accessibility of Turner's work. While Turner popularised the concept, it was ethnologist Arnold Van Gennep (1960) who initially described the notion of ritual liminal space in relation to tribal ritual observations in 1909. It is van Gennep's description of liminal space that more closely and deliberately aligns to the term's etymological origins.[1] The concept of the liminal phase within a tripartite structure originated with van Gennep's recognition of the significance of spatio-temporal thresholds in tribal ritual practices of African and largely pre-literate societies. As the recognition of the liminal was derived through van Gennep's particular method of observation tribal passage, in this way, the origins of liminality do indeed lie in modes of concrete, or physio-social, spatial analysis.

In an opening chapter of van Gennep's (1960) publication *Les Rites de Passage* (The Rites of Passage) titled 'territorial passages', he describes how the tribal subjects of his study observed certain symbolic rituals as they moved across borders or entered at thresholds of both houses and temples. The significance of the threshold is underscored in van Gennep's rich descriptions of these examples including that of the door to an

[1]The etymological roots of liminality are located in two key and related concepts: the threshold and the limit, respectively the *limen* and *limes* in Latin.

ordinary dwelling as a "boundary between…foreign and domestic worlds", and the entrance to a temple that becomes a mediating place between the worlds of the sacred and the profane (van Gennep 1960, p. 20). Significantly, in van Gennep's assertion "…to cross over the threshold is to unite oneself with a new world" (p.20), the threshold becomes not only a place of transition, but also significantly, a place of transformation.

Van Gennep recognised that the transitions between secular and sacred conditions were articulated in a physio-spatial sense, but also less permanently through symbolic behaviours that he described as *rites*. Such rites, he noted, served to establish an alternate "quality of time", thereby distinguishing the alternate cultural realms (those which cannot be marked in any other way) (Turner 1974, pp. 56-57). From a comparative study of a wide-range of anthropological research examining tribal ritual in situ, he determined that a three-stage sequence or pattern could be identified in many of the examples. Adopting a rhythmic analogy van Gennep (1960) described three major ritual types as: rectilinear, cyclical, and alternating. Significantly in each of these ritual types he described how symbolic rites were employed to mark, but also, *organise* transitions (p.3). In this way, ritual symbolic rites—whether behavioural or those expressed in spatio-material ways—were recognised as a method to manage the impact of some form of change or transition from one previously 'defined' position to another, of an individual, or as a collective.

In addition to tribal rituals, van Gennep classified a range of other events as rituals, including birth and death (linear/staged/irreversible), calendrical occasions such as agricultural milestones observed through festivities and carnivals (cyclical/repetitive), and the observation of solar, lunar, and Venusian cycles (alternating/reoccurring) (van Gennep quoted in Turner 1982, p. 252). Rites of passage were observed to be associated with both material (physio-spatial and corporeal), and immaterial (social) change. These rites functioned to both signify, but most significantly manage the movement of people and groups from place to place, as well as transitions of social status within a group, such as would occur at puberty, and 'life crisis' events such as pregnancy and childbirth, betrothal and marriage, and funerals.

What van Gennep's (1960) comparative study identified was a common triadic ritual structure that he argued constituted evidence of a 'universal pattern' in ritual passage

across cultural contexts. He described this three-phase passage with two sets of terms with the first—regarded as highlighting the social action of ritual passage—being the rites of *separation*, rites of *transition* and rites of *incorporation* (Van Gennep 1960; Gluckman 1962). Here van Gennep placed particular emphasis on the description of the middle phase, referring to it also as the "rites of the threshold" (1960, p.20). Additionally, he stressed that the middle phase did not concern a union, but rather constituted a phase of *preparation* (1960, p.21). This followed on from the initial stage where the subject is separated from their previously defined position and lies in anticipation of the union or re-aggregation to occur in the final phase (van Gennep 1960, p.21). As such, while the first phase of the ritual process is characterised by a detachment from a prior fixed point in a social structure or set of conditions, it is during the middle phase that the ritual subject is alleged to reside free of all classification. The concluding third phase of the ritual passage describes conditions of re-aggregation, reincorporation or reinstatement with the objective of arriving at a (new) position of stability.

The second, and arguably more recognisable set of terms van Gennep adopted to describe the ritual passage, recall his initial studies of spatial thresholds. Here the term 'liminal'—a derivative of the Latin *limen*—is the binding term, resulting in the alternate description of ritual phases as pre-liminal, liminal, and post-liminal. Turner (1977a) argued that this alternate set of terms provided a "…primary reference to spatial transitions", and that this indicated van Gennep's "…basic concern with units of space and time in which behaviour and symbolism are momentarily enfranchised from the norms and values that govern the public lives of incumbents of structural positions" (1977a, p.166).[2] In short, by adopting liminal as a key term, the representation of ritual passage expressed a distinctly spatial dimension. Given this, van Gennep's liminal-centric ritual passage theory is considered here to constitute 'second-order' liminality.

While van Gennep analysed the mechanisms of ritual it was Turner who gave greater focus to exploring their symbolic meanings, and significantly, extending the liminal into a broader theory of liminality (Gluckman 1962, p.4). Upon reading van Gennep's *Les*

[2] Turner defines his use of the term "structure" here to be understood in the British Social Anthropological sense and to refer to "social structure", and not in the broader categorical sense as adopted by Levi- Strauss (1977a, pp. 166-167).

Rites of Passage in 1962, written in 1909 but only translated into English in 1960, Turner found that its processual notions resonated strongly with his own work, and particularly his views on societal organisation through conflict management based on his observations of the Ndembu tribes of northwestern Zambia (formerly Northern Rhodesia). Particularly, he described the concept of "social drama" as part of a four-stage process of social conflict (Deflem 1991, pp. 2-3). The significance of this concept is twofold. Firstly, Turner observed that social drama was not a product *of* social conflict, but rather a strategic method for enabling social change. By virtue of this, Turner identified the role of social drama as part of a larger social process. Secondly, Turner described these social processes as dynamic; he recognised the plasticity of societal structures, and the nature of their ongoing becomingness. Fittingly, he described social drama as a form of "redressive machinery", and as a curative mechanism enacted to repair the social fabric (1974a, p. 38-41; 1982, p.10).

The alignments between van Gennep's early ritual descriptions and Turner's four-stage social conflict process are numerous. In van Gennep's pre-liminal stage he describes the act of separation from a previous world (1960, p. 21), while Turner's notion of social drama describes a measured break with normative society in order to reveal extant, or otherwise unseen societal relations. Similarly, where van Gennep describes the liminal stage as a phase where former states, and or statuses are suspended or removed, Turner's third-phase of social drama recounts notions of breach and isolation exercised or controlled through law, or religion, or both (1982, p.251). Turner equally argued that rites of passage took place within instances of social drama, and that here liminal phenomenon was particularly expressed. What each scholar had identified were mechanisms to manage and control processes of societal transition and transformation.

While Turner (1996) had made reference to the notion of "processual form" in his 1957 publication *Schism and Continuity in an African Society: A study of Ndembu Village Life,* his reading of van Gennep's work compelled him to further develop these ideas (Deflem 1991, p.4; Thomassen 2012, p.23; Turner (E) 2008). That Turner's interpretation and extension of liminal theory gained more scholarly traction than van Gennep had in 1909, highlights how both the anthropological discipline and social theory changed from the early to mid-twentieth century. Turner's liminal theorisation coincided with concerted shifts in anthropological thinking, as well as the wider

Western academic tradition more generally with the shift from structuralist to post-structuralist thinking. Reflecting on Turner's then radical assertion that societal structure could be seen as secondary to, and dependent upon, process, Barbara Babcock argues that "Turner deconstructed the received wisdom of anthropology" (2008, p.298).

The view that societies should be understood as dynamic departed significantly from long-held views and methods common to the British anthropological discipline. Equally, the argument that ritual activities could "confound political or ethnic boundaries was inherently problematic for a discipline whose strength ha[d] always been the intensive study of the little community" (Sallnow 1981, p.163). For Turner, van Gennep's processual approach served as a robust conceptual framework to further substantiate his own views, including that the social world should not be viewed as a fixed thing but rather as "…a world in *becoming*, not a world in being" (1974a, p.24).

Notably, Turner saw human life as "…fundamentally in flux, in motion" (1982, p.244). Critically, and as his concept of social drama attests, he understood social processes as not simply the reflection of existing social structures, but rather as integral to their very organisation and expression. Given this, unlike van Gennep's structuralist methodology that limited him to identifying and describing a ritual pattern, Turner's approach to ritual studies was necessarily performative.[3] Indeed Turner's interests and modes of investigation are generally regarded as having strongly contributed to the *performative* turn in social anthropology. A performative approach represented a significant departure from conventional social analysis models of the time that favoured static social-structural approaches.[4] Turner's additional focus on ritual performance and its relationships to ritual symbols, allowed him to ask fundamentally different questions around the generation of social and cultural meanings.

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[3] Turner describes how positivist and functionalist thinking in anthropology provided limited apparatus to understand 'dynamic' social processes. He reflected, that he could count, describe, collect information and, place this into a structural social system, but that this treated "social facts as things" and failed to understand motives and meanings (1982, p.12).

[4] This entailed a dynamic, as opposed to static reading of social relations in contrast to the social-structuralist theory espoused by the British structuralist anthropology of the Manchester School (Deflem 1991, p.22) that upheld a rationalist account of social fact and viewed the object of study as a static form (Turner 2008).

2.4 Second-order Liminality: Turnerian anti-structure

Turner's application of van Gennep's ritual passage theory and processual methodology in the study of Ndembu initiation rituals, further substantiated van Gennep's proclaimed universality of a ritual passage pattern. Significantly, Turner's work cemented liminality as a twentieth century meta-theory. The extension of the liminal paradigm from ritual passage theory, to a theory of liminality is considered here to constitute second-order liminality.

Through fieldwork observations, like van Gennep, Turner recognised a strong expression in the middle liminal phase of ritual passage. His keen interest in exploring this phase is reflected in his 1964 seminal essay *Betwixt and Between: The liminal Period in Rites de Passage.* Particularly, here Turner describes the experience and status of ritual subjects in the "marginal" or "interstructural" situation of liminality (1985, p.46). The characteristics liminality has assumed in much contemporary discourse refer back to the observations of Ndembu initiation rites Turner describes here. While he notes that liminality finds its strongest expression in the ritual examples of "smaller-scale" and "simpler societies", he argues that liminality can be observed in all societies (p.46). Liminality is deemed to be present in the ways many cultures manage moments of change: transition, becoming, and transformation. Liminality's significance for Turner lay in its evident state of 'statelessness'. Here Turner famously describes how liminal *personae* are "…neither here nor there; they are betwixt and between the positions assigned and arrayed by law, custom, convention, and ceremony" (1969, p.95). Such ambiguous and indeterminate attributes are paradoxically how, he argued, the very "building blocks of culture" could be revealed (p.46).

According to Turner, liminality describes a condition or phase that is otherwise indescribable; a 'space'—a state of mind and/or a symbolic physical space—where subjects "elude or slip through the network of classifications that normally locate states and positions in cultural space" (Turner 1977a, p. 95). A key example is the phase of puberty. Turner notes that secular society's definitions do not "allow for the existence of a "not-boy-not-man" ", yet the rites of passage provide symbolic definition to this otherwise undefinable state-between-statuses (1985, p.47). Subsequently the ritual passage, and its middle phase of liminality, serves to equip both the subject, and their

wider community, with the means to mark, comprehend, and make meaningful often challenging transitional periods of life. In one sense this can be interpreted as the assignation of symbolic meaning to states and statuses that escape conventional understandings, yet in many rituals it is also a phase where initiates are dispossessed, isolated, or confined. In this interpretation liminality is part of a larger dialectical process of social life.

Similarly, calendric rituals such as agrarian festivals established in pre-industrial times exhibit liminal qualities. Agrarian festivals align to key transition periods in agricultural work, such as prior to harvest and mark the passage from scarcity to plenitude (Turner 1977a, p.169). This example describes how liminality is also interpreted as occurring in a cyclically defined time frame, and being experienced by a community, here bound by farming in a particular geographic location. Such festivals provided a context for the community to come together in an expression of blessing and prayer for a plentiful harvest. This is said to be transformative in the sense that celebratory festive practices can distract from an otherwise idle and anxious in-between period between seeding and harvest. In this way, calendric festivals became a method of maintaining social cohesion during a time of uncertainty by—ironically—creating conditions for the community to cast-off the usual ways the society operates. Such festive practices reflect an *implicit* permission of certain freedoms, expressions, and non-normative activities (Turner 1977a). In short, for the duration of such festivals and within the physical limits of the festival area, a suspension of societal norms was implicitly sanctioned.

In the ways that ritual subjects are stripped of status, and festival–goers are tacitly permitted to behave outlandishly, Turner argued liminality constituted the anti-structural phase of a dialectical social process. Drawing on his concept of social drama, he saw liminality as a necessarily anti-structural condition to create the context for productive societal reflection. This characteristic of liminality is more acutely expressed in ritual liminality where, stripped of their former statuses, the neophytes or initiates of tribal ritual practices, were, such as in the case of puberty rites, "…forced and encouraged to think about their society" (Turner 1985, p.53). Turner argued that with societal roles temporarily removed, reversed or suspended the "…'subcutaneous' levels of the social structure" are revealed (1982, p.10). In this way, liminality does not merely

name an in-between condition, place, or time, but rather institutes a release from normality.

2.5 Third-order Liminality: Turnerian modernisation

Uses of the liminal that focus only on the characteristics of in-between-ness and ambiguity, or that view "liminal space" as nothing more than a descriptor, or "point of transition", can eschew its more compelling criticality (Endsjø, 2000, p.365). Beyond tribal ritual contexts, liminality offers a chance for the "…deconstruction of the 'uninteresting' constructions of common sense" (Turner 1977b, p. 68). As both a time and a place of withdrawal from the "normal modes of social action", in the anthropological sense of the concept, liminality represents a 'space' for cultural scrutinization (Turner 1977a, p.167). So, while van Gennep had identified and classified tribal ritual stages in a triadic sequence, Turner sought to understand the structure and significance of ritual *experience*. In so doing, Turner argued that the foundations of the structure of experience could be revealed in the liminal stage. In short, he claimed that liminality contained the source of cultural meaning, as "…'meaning' in culture tends to be generated at the interfaces between established cultural systems …" (Turner 1982, p.41).

Given such qualities, Turner argued the liminal paradigm could be extended well beyond the context of pre-industrial tribal ritual contexts. His earlier work drew on examples in contemporary religion, pilgrimage, festivals, warfare, and the countercultural movements of the 1960s to demonstrate this.[5] Moreover, Turner identified conditions that *resemble* liminality, as well as those that appeared to be a form of protracted liminality. In tribal and calendric rituals liminality is a *temporary*

[5] On the wider application of liminality for contemporary society, Max Gluckman, Turner's Doctoral supervisor and later colleague, took particular issue. He argued that, "…rituals of the kind investigated by van Gennep are 'incompatible' with the structure of modern urban life" (1962, pp. 36-37). He pointed to the individualisation of the lived life, stating, "…ritual and even [the] ceremonial, tend to drop into desuetude in the modern urban situation where the material basis of life, and the fragmentation of roles and activities, of themselves segregate social roles" (1962, pp. 38-39). Given this, he argued, ritualism had become dispersed through a range of different and complex social relationships (p.43). He conceded that "pockets" of modern societal relations could *resemble* tribal society (1962, p.43, my emphasis). Where Gluckman lamented the end of ritual, Turner (1977a) alternatively saw its transference, and called for scholars to rethink the very notion of ritual for a post-industrial context (p.107).

condition, experience, or phenomena, as distinct from a stabilised notion of a state,[6] and is followed by a phase of re-aggregation and where a person or group's status is 'transformed'. Yet, Turner found in various modern examples that liminality had in some instances stalled and become 'state-like' (1969, p.167). Citing the practices of the monastic Franciscan and Carmelite orders, he noted that the very condition of transition itself had become institutionalised, and that this demonstrated a more permanent sense of liminality (1977a, p.107; 1974a, p. 244). Similarly, Turner cited wartime more generally as a perpetual liminal condition. What these examples speak to is liminality's temporal elasticity, that is, the way liminality is considered to vary in duration from shorter moments and longer periods, to entire epochs (Thomassen 2012, p.24).

While Turner's early work attested to liminal conditions being evident in the formative stages of *all* cultural processes and states—ecological, physical, mental or emotional, and those experienced by a person or group—he later called into question the adequacy of liminality as a label for conditions in post-industrial societies. Particularly, in the essay, "Liminal to Liminoid, in play, flow, and ritual", Turner (1974b) emphasised that the manifestation and intensity of liminal phenomena relies on *specific* socio-structural contexts and that liminality proper belongs chiefly to relatively stable, cyclical, and repetitive societal systems. Yet, for a great many examples, Turner argued that the application of liminality to the "…processes, phenomena, and persons in large-scale complex societies…must in the main be metaphorical" (1974b, p.62). Equally, he argued, liminal rites would likely acquire new forms of expression in complex post-industrial societies and to that end he introduced two additional sub-concepts: *communitas* and the *liminoid*.

Arguably, Turner's introduction of communitas and the liminoid served to both expand on notable characteristics observed in liminality (communitas), and also extend liminality's viability beyond tribal ritual contexts (the liminoid). The concept of communitas elaborates on the distinctive social behaviours observed in liminality, referring to instances of camaraderie between individuals that can result from the temporary removal of normative structures, including rules and forms of social classifications (Turner 1977a, p.96). Communitas describes those relationships forged

[6] A normative state is described by Turner as a "type of stable or recurrent condition that is culturally recognised" (1985, pp.46-47).

between individuals during the liminal phase where structure is stripped away. The liminoid concept however articulates the issues faced when translating liminality from tribal ritual contexts to modern conditions, and speaks to the complexity and obscurity of social processes in large-scale post-industrial societies. According to Turner what is liminoid are conditions that *resemble* liminality, examples of which he argued were contemporary forms of leisure, arts, and sports. Such practices could be viewed as liminal-esque if regarded as antithetical to the normative structure of organised capitalism and its industrial and bureaucratised work practices (Turner 1974b, p.62).

However, distinguishing between the liminoid and the liminal is not so easily achieved. Surveying the differences and alignments between these concepts reveals problematic generalisations. Broadly speaking, leisure and art practices are argued to resemble liminality in that they constitute a break from normality. This understands the notion of 'leisure' as a 'playful' or ludic experience that is governed by a specific set of rules and expectations of behaviour that lie outside, or depart from, the overarching tacitly understood rules of civil society. At an overarching level, while leisure or art practices are considered to be antithetical they are also necessary to the overall functioning a larger system, namely and in a Western sense, capitalism. This highlights the significance of who engages leisure and art practices. For example, where art is commissioned by bureaucratic organisations, is it still a subversive practice? In this instance, as in liminality, art-as-subversion operates under controlled conditions, where the overall intention, paradoxically, is to return to a renewed structure and order.

While within the overall schema of capitalism, leisure practices are seen as necessary to the overall functioning of societal order, when considered at the scale of the individual leisure practices the translation of liminality is complicated by the notion of optionality. Optionality in this context assumes that the individual or group engaging in leisure, sport, and art, are, at any given time, not governed by, nor knowingly intending to serve the interests of larger societal structures. Recurrent instances of dipping in and out of such practices do not necessarily align to the processual nature of ritual practices. Equally, classifying all leisure practices as liminal relies on the reductive view that "[i]n complex, large-scale societies…the sphere of leisure is *clearly* separated from that of work" (Turner 1982, p. 104 my emphasis). In a contemporary context and with

particular consideration of the pervasive nature of mobile technology practices, the separation between spheres of work and leisure have become arguably less clear.

The liminoid concept goes some way toward addressing the complexities of contemporary society and its practices. The liminoid acknowledges that individuals or groups in modern Western capitalist contexts can sporadically opt in or out leisure, sport, or art practices. In labelling such practices liminoid-al it is assumed that the critical attribute of liminality in ritual rites—transition—is neither the intended goal, nor a possible outcome. As Thomassen well notes "[t]he liminoid is a break from normality, a playful as-if experience, but it loses the key feature of liminality: *transition* (2012, p.28). Liminoid practices do echo liminality in that they function as a time-outside-of-time where, for example, an individual playing a sport is subject to the unique rules of the game for its duration. Yet Turner's liminoid assumes that at the completion of the game the individual(s) will resume their prior behaviour and status within the societal context to which they belong. It is assumed that neither the individual, nor group, nor those in their context (immediate or otherwise), are greatly changed—transformed in status—by passive or active participation in contemporary leisure practices.

The liminoid concept is of note in this thesis chiefly as it represents how Turner attempted to resolve liminal theory's relevance for contemporary conditions, and namely, post-industrial modern Western practices. Turner's formulation of this alternate concept signifies his recognition of the limits of liminality's plasticity, and compels consideration of what it means for a thing, person, situation, action, or space to be deemed liminal. Yet the liminoid concept is also peculiar to the time it was conceived and reflects Turner's somewhat parochial views of consumerist practices in Western capitalist societies. Such views align to other postmodern writers (Sennett 1993) who decried the fall of religious participation and the rise of individualism, and viewed consumer practices as pointless, indulgent, and without meaning or cultural significance. This is suggested in Turner's assertion that as the sphere of religious ritual had contracted that "…non-serious, non-earnest genres, such as art and sport…have largely taken over the flow-function in culture" (1974a, p.90). Unsurprisingly, given this tendency to downplay the cultural and social significance of contemporary leisure, sport and art practices, the liminoid concept has been far less popular than its antecedent.

Ultimately, Turner's search for strong expressions of social drama, of liminality, and of ritual-like instances in contemporary Western society, led to contemporary theatre. Given his focus on liminality's processual and performative qualities, it is understandable that he would find a logical and subsequent expression of ritual practice and social drama in modern theatre, that he further argued best represented liminality in "proto-aesthetic form" (1986, p. 43). Turner described contemporary performance genres as primary examples of "public liminality", where metasocial rites are often performed in the "village or town square in full view of everyone" (1979, p.467). More specifically, he argued that the institution of modern theatre provided a setting to reflect society back to itself and thus allow for its scrutinization. In historicising ritual progression, Turner reflected that "…the simpler societies have ritual or sacred corroborees as their main metasocial performances: proto-feudal and feudal societies have carnival or festival; early modern societies have carnival and theatre; and electronically advanced societies, film" (Turner 1979, p.468). In this way, carnivals, theatre and film are positioned as playing significant roles in the overall maintenance of society in ways that "dramatize[] secular, political, and legal status relationships" (1979, p.470.

Turner further argued that contemporary stage dramas are genres that are liminal-like and thus liminoid, as "[l]iminoid phenomena…flourish in societies of more complex structure" (p.492). Liminoid phenomena may be collective or individually created, have mass or collective effects, yet they are not considered cyclical but rather intermittent and commonly associated with the sphere of leisure. According to Turner, "liminoid phenomena, unlike liminal phenomena, tend to develop apart from cultural political and economic processes, along the margins, in the interstices, on the interfaces of central and servicing institutions – they are plural, fragmentary…and often experiential in character" (1979 p.492). Significantly, by ways of distinction he offers that "liminoid phenomena, unlike liminal, do not so much *invert* as subvert quotidian and prestigious structures and symbols" (1979, p.493). The distinction Turner offers is that performance genres *deliberately* aim to be liminal-like and to provoke liminal-like modes of reflection; they are not interested in maintaining or restoring a social datum, but rather seek to draw focus to a social problem. In stage drama, "[a] cultural problem is irradiated into full visibility for the audience to reflect upon passionately", the audience is not transformed in the liminal sense as their status is not changed, rather, they become

aware and then resume their former status (Turner 1979, p.490). This elevates liminoid phenomena to the role of cultural disruptor. And in this way performance genres such as theatre, art, and film are generally cast as critical spaces of otherness whereby the individual or a group may be prompted to reflect on their situation, and be 'moved' by what is presented, but otherwise remain unchanged.

2.6 Fourth-order Liminality: Critical spaces

Since Turner's theorisation, a great many examples of contemporary academic research have adopted and adapted the theory of liminality. Numerous examples give focus to liminality's defining, and thus popular, characteristics of in-between-ness, ambiguity and anti-structure, and creative potential. Understandably, it is often not the objective, and certainly not possible within the limits of, for example, a journal article length, to fully explore the various facets of liminal theory. Given this, the tendency has been to set aside the larger tripartite process to which Gennep and Turner's liminality belongs, and to focus primarily on the attributes of the middle *transitional* phase. Yet, subsequently in isolating liminality in this way its significant role in the larger process of transition and transformation that attends to the maintenance of social order is obscured, and it is relegated to the textual role of descriptor. This conceptual truncation serves to eschew questions that might otherwise weaken the validity of liminality, and the liminal, as a descriptor for a range of conditions, people, or places.

Common-sense and theory-lite uses of liminality and the liminal pay far less attention to the slippery and potentially divisive nature of liminality's anti-structure, such as articulated by the archetypal liminal personae of the "trickster figure" (Babcock 1975; Horvarth 1998; Thomassen 2009). In this sense, a large proportion of scholarly work focuses only on "positively skewed interpretations" of liminality (Thomassen 2012, p. 27). Certainly, in Turner's discussion of ritual liminality, the conditions and purposes of liminality are not always positive. Ritual types, and hence liminal conditions, necessarily differ depending on their role, and as Turner reflects "…initiatory passage rites tend to "put people down" while some seasonal rites tend to "set people up" (1974, p. 57). Yet, Turner's own claims to liminality as a process of meaning-making, and his reference to the liminal state as a fertile seeding ground of creativity, has arguably

contributed to not only a valorisation, but also a more positive interpretation of in-between, and interstitial positions, states and statuses.

Given the tendency for positively skewed interpretations, liminality has frequently found itself in the service of the rejection of absolutism; functioning as a space to challenge extant, fixed, and closed definitions, static limits and traditional boundaries. Subsequently, liminal theory has become a popular champion for diversity, divergence, transgression, ambiguity, and hybrid conditions. It is often seen as conceptually representing an opposition to the singular position and the singular view, and in this way is considered to have contributed to the conceptual deconstruction of 'modernity' and its premises (Thomassen 2012b, p.161).

Particularly, liminality has found recurrent use in discussions of cultural and social identity and subjectivity, and liminal thinking has become significant to examining issues of geo-political identity. Homi Bhabha's (2012) seminal text published in 1994, *The location of Culture*, is an oft-cited example of theorising that implicitly embodies liminal characteristics. Bhabha's work is seen as an ethnographic and postmodern interpretation of liminality. Although he makes little reference to liminality's anthropological origins, namely Turner's theorisation of ritual process, Bhabha evokes liminal thinking in his references to 'in-between' spaces as the "terrain for elaborating strategies of selfhood – singular or communal", and the interstices as where "the inersubjective and collective experiences of *nationess*, community interest or cultural value are negotiated" (Bhabha 2012, p.2). Bhabha further evokes Turner's concept of social drama in his argument that the terms of cultural engagement are produced *performatively* (p.3).

Bhabha's hybrid cultural theorisation draws focus to the liminal conditions of postcolonial identity. The liminal gaze here acts as a critical method to actively shift the focus away from the finality of so-called cultural facts and instead towards the action in-between, and to the borderlines of cultural identity. In this way, the liminal functions to undermine claims of cultural authenticity and ownership, by articulating the hybrid and dynamic nature of cultural identity. The liminal is engaged as a powerful notion here as it recasts the notion of cultural difference without assumed or imposed hierarchies. As Turner states, "the attributes of liminality or of liminal or liminoid

personae (threshold people) are necessarily ambiguous, since this condition and these persons elude or slip through the network of classifications that normally locate states and positions in cultural space" (1977a, p.95). This interpretation of liminality "still refers to an in-between state and the transgression of borderlines, it ceases to refer to a temporary situation in a finite and teleological process" (Klapcsik, 2012 p.13).

Liminality has found frequent use as a conceptual tool to advocate for, and give representation to, oppressed or marginal cultures. When seen as a borderland outside of structural descriptions, for the subjugated, liminal space is presented as a place of refuge "…beyond the reach of oppressive, paralysing, demeaning, reductive descriptions" (Lugones 2006, p.77). As a mode of 'border-thinking', liminality has provided a useful framework to construct alternate perspectives on conditions of marginality and displacement, such as experienced through voluntary and forced migration (Voutira 2003; Simich et al. 2009; Dam and Eyles 2012; Den Boer 2015). Eftihia Voutira (2003) adopted this approach to shift negative attitudes towards refugees, who are otherwise seen as "people in a state of liminality, betwixt and between, who, unless they are integrated into the state, remain, to use Mary Douglas' imagery of pollution, 'matter out of place'" (p.4).

Similar themes are explored in Roselinde Den Boer's (2015) reflection on the experience of Congolese refugees in Kampala. Liminality is established here in defining refugees as those who have been "territorially uprooted", and thus, "torn loose from culture" (Den Boer 2015, p. 487). Yet, Den Boer goes on to challenge the assumption that liminal beings are thus rendered powerless and without identity by rejecting essentialist understandings of the concept home, and refugees' attachment to it. In doing so, she highlights how the concept of liminal space, predominantly seen in the context of refugee studies as representing ambiguity, dislocation and exile, can alternatively represent a productive space where alternate conceptualisations of 'home' are fostered.

In order to explore how the temporary and transitory nature of the migrant experience produces liminal spaces of occupation, Antonia Noussia and Michal Lyons (2009) assign liminal status to ethnic minorities, as well as poor and illegal migrants. They discuss how, in a range of cities, migrant groups have been shown to take up occupation in abandoned, or otherwise uninhabited sites in ways that then transform those spaces

through the creation of informal labour exchange—liminal action (p.602). Notably, the authors describe how, rather that the physical characteristics of the space itself, it is the migrants' situation and experience as 'in-transition' and in-between cultural belonging as well as their activities that "leads to the creation of liminal spaces" (p.619). Similarly, Paul Tabar (2005) describes the liminal character of the *dabki* danced by Lebanese migrants in Australia, as that which "enables migrants to transform the *home*land into a *here*land and consequently to put an end to their bodily (dis-) engagement in the host society" (p.150). Tabar asserts that the *dabki* creates a "liminal space where the uncanny of the present moment is bracketed and memories of the migrant's country of origin are activated with high intensity" (p.150). In close alignment to Turnerian descriptions of ritual liminality, he further argues that the "*dabki* becomes a cultural practice which helps the migrant to cope with his feeling of homesickness and desolation" (p.150). In this way, the *dabki* is understood as enacted to manage cultural transition and change as well as constituting a site of cultural production.

Given liminality's core characteristics of process, dynamism, performance, and the action in-between, it has found various cross-scalar applications in both a social and spatial sense. While the aforementioned cases have assigned liminal status to large groups, elsewhere in the disciplines of medicine, psychology, and education, liminal theory has been applied at a phenomenological level and in the exploration of various types of individual experience. In health studies, research into chronic illness has adopted liminality as a conceptual lens to explore the space of chronic pain, where liminal space is described as the borderland between mind and body (Jackson 2005). Elsewhere, the experience of loss and grief associated with chronic illness is understood as a liminal space, and more specifically, "[a]s a psychosocial space, a mix of forces, tensions, missing objects, and experiences, [that] constitute liminality" (Kelly 2008, p. 336). In these and other illness and mental health examples, and aligned to Turner's application of liminality to monastic orders, liminality describes a state of suspension as it has become a way of life for those living with chronic illness, or undertaking religious instruction.

In response to Louis A. Sass' (1992) publication *Madness and Modernism: Insanity in the light of modern art, literature, and thought,* Robert J. Barrett (1992) argued that, when reframed as a social category rather than a psychotic illness, schizophrenics can

be alternatively understood as liminal persona. To validate this contention, Barrett likens the transformation that takes place following a clinical diagnosis of chronic schizophrenia, as well as the ritual-like aspects of hospital admissions, to the sequential ordering and cultural processes of transformation of liminality. Subsequently, in this example liminality assumes two key roles. Firstly, as an overarching framework to examine the construction and symbolism of schizophrenia and the ways such cultural constructions had come to define schizophrenics in society, and secondly as an analytic tool to understand how the very *experience* and transformative implications of a schizophrenia diagnosis. Elsewhere in another mental health example, liminal space describes the social and communicative 'gap' between mental health service providers and their patients (Warner and Gabe 2004).

In still another example that adopts liminality to theorise the transformative experience of an individual, Boyce-Tillman (2009) describes a phenomenography of musical experience as that which facilitates access to a liminal other space "[i]nsofar as musical experience takes us out of everyday consciousness…and moves us into another dimension" (p.188). In this example, the liminal 'other' closely aligns to its origins in anthropology. This can be understood in the way Boyce-Tillman (2009) describes how music therapy incites a virtual space of affect and spirituality in ways that conjure altered modes of perception and understanding (Shields 2003, p.11). In the context of music therapy 'musicking' is as an organised setting for transformation from one status to another and in this sense aims to fulfil liminality's critical function. Central to this are the ways that music can remove a person from everyday reality to enter a transitional imaginative or virtual space (p.192). Yet in the general sense while a person's experience of music, may conjure a virtual place of reflection and meditation, this is not necessarily liminal as it may not be a structured process of transformation. As the experience of music is often an optional individual experience, this suggests that, in the main, musical experience accords with Turner's concept of the liminoid where aspects of virtuality and reflection are made possible, yet a 'life-changing' status is less likely, or indeed appreciable. This example is particular useful in this research as an example of how a liminal approach to thinking through transformation opens up to a different set of questions around the individual experience of urban public space as mediated through mobile technology practices.

From a pedagogical perspective, a number of studies have described modes of learning and teaching in liminal terms (Meyer and Land 2005; McCartney et al. 2008; Cook-Sather and Alter 2011; Harfield 2014). A key characteristic of liminality in tribal ritual describes a learning-like stage in which old roles are removed and new roles and/or skills are developed in order to be readied to re-enter society as a transformed subject. Subsequently, the ontological assumption is of liminal space as a learning environment. Practices of teaching and learning can be equally understood as liminal in the sense that teaching strategies are often process driven, concepts or proficiencies are introduced in stages, and learning typically aims to catalyse a transformation in a student or student cohort's knowledge and/or skill. For Cook-Sather and Alther (2011) however what is liminal in their use is the concept of a "student consultant", a position they describe as deliberately in-between the traditional teaching hierarchy of discipline and follower (p.37).

Referencing Meyer and Land's (2005) threshold concept, McCartney et al., (2009) take up another approach to the application of liminal thinking in education, describing the 'liminal space' of learning in relation to the process of understanding key concepts that shift and 'transform' the way a student perceives the discipline. From a more critical position Stephen Harfield (2014) takes up the question of liminality and learning to point out how, understood in the sense of transformation, learning involves, not merely the acquisition of new knowledge or skills, but rather a shift in personal understandings. This reading brings emphasis to the significance of the liminal phase as a period of self-reflection and the ways that, from an educational perspective, this might cause students to think differently.

The pedagogical case examples cited here, and in particular Harfield's (2014) discussion demonstrate the value of liminal thinking in interpreting notions of epistemic and perceptual transition and transformation from the individual's perspective. Drawing focus to a defining characteristic of liminality—*self*-reflection—highlights how the liminal experience might net different degrees, or indeed qualities, of transformation for different people. This phenomenological reading of liminality problematizes wholesale claims to transformation, and further suggests that notions of transformation must account for the individual and their particular context or situation. The phenomenological interpretation of liminality is important to this thesis' consideration

of the relationships between mobile technology practices and urban public space as it provides a way to challenge indiscriminate claims to transformed perception. And of particular significance to the discussion of mobile technology practices and liminal spaces, is Harfield's assertion that the condition of liminality can be understood as "user-determined" (2014, p.99).

Equally significant to this thesis are examples of liminal thinking that have addressed issues of cultural identity and its (re)formation. This is particularly so in the way these examples work across the scales of group and individual experiences, as liminal events and liminal beings, but also critically the way they consequently see place as a liminal space. Liminality is particularly productive in the context of calling into question the origins of cultural identity as it operates to problematize the relationships between people and space or place. In many of these accounts place, in the geographic sense, is no longer seen as central to cultural identity. In turn notions of place are not seen as static characteristics, but rather as recursively constituted through dynamic socio-processes. From this perspective the meaning and representation of spaces and places can be understood as iterative, in continual modes of becoming, and thus highly contingent.

Similar processual and dynamic notions of place have been explored in the large body of work that has interpreted liminality in terms of geography, landscapes, and places, albeit arrived at from a different disciplinary framework. These interpretations have attributed liminality to various spaces and places that exhibit mediating and/or ambiguous characteristics. This includes spaces deemed as negotiating between or beyond institutional definitions and dichotomous assignations, such as the natural and the artificial, the local and the global, and public and private. Most obviously, liminality also finds reference in relation to in-between geographies. In particular, coastal locations have been typically described as liminal in a physio-spatial sense. Beaches and seaside locations are considered to be liminal in that they constitute geographic edges, and are geographical areas that negotiate *between* land and sea.

Coastal locations have equally been identified as liminal with respect to their socio-performative attributes. In his publication *Places on the Margin: Alternative geographies of modernity* (1991) Rob Shields identifies particular contexts, in a spatial,

temporal, and situational sense, in ways that effectively historicise liminal spaces. For Shields the seaside resorts of Brighton, England, as well as the classic honeymoon destination of Niagara Falls, Canada, represent quintessential examples of carnivalesque leisure spaces, or, "liminal zones of Otherness" and places of "ritual inversion" (1991, p.6). Significantly, in each example, Shields identifies such places as liminal only insofar as they were historically popularly perceived as offering 'life-changing' potential (a restorative holiday retreat) or signifying a 'life-changing' transition (honeymoon period). These places are thereby not necessarily considered as permanently liminal spaces. It is the popularly held expectations or perceptions that Shield's asserts transform these particular times and places into liminal zones (1991, pp.83-84).

More generally, as a release from normative roles and behaviours associated with the sphere of work, vacationing, holidays, holiday destinations, travel, and tourist *practices* have attracted liminal theorisations (Urry 1990; Urry and Watts 2008; Urry and Larson 2011). Notably, sociologist John Urry (1990) adopted liminal theory as a productive way to theorise the tourist *experience* (p.2). According to Urry tourist practices are liminal in the sense that they can be understood as 'deviant', that is, practices that differ significantly from the everyday practices of work (1990 p.2). He reflected that "in much tourism everyday obligations are suspended or inverted" (Urry 1990, p.10). In framing tourist practices as characteristically liminal, Urry established that they were not only transformational experiences in their own right—thereby constituting a social phenomena worthy of study—but significantly that their examination could "reveal interesting and significant aspects of 'normal' societies" (1990, p.2). As tourist practices are constituted through movement, what is liminal space in Urry's sense is not a specific geography or type, but rather an experience, a perception, or in his terms, a 'gaze', that is made and remade by the moving body and the roving eye. Similarly, the travel experience is likened to the tripartite ritual liminal stages including residing in, departing from, and returning to one's 'home'.

Broadly speaking, the liminal perspective has offered ways to legitimise the study of mobility practices. Viewing tourist travel, as well as everyday commuting, in liminal terms has provided a way to validate such practices as meaningful (Urry and Watts 2008; Johnson 2010; Ng-Chan 2015). For Ng-Chan, who rejects Marc Augé's (1995)

popular notion of transport environments as non-places, liminal theory serves to articulate the social and experiential significance—such as evidence of communitas—of mobility and travel time. In drawing more specifically on Turner's concept of communitas, like Urry, Ng-Chan asserts the social performance, and thus significance, of travel time. Equally, examples such as these are emblematic of a broader turn in academic thinking, and in particular, the so-called mobility-turn in the social sciences. Building on the work of progressive geographers such as Doreen Massey (1994), such thinking has sought to challenge and eschew purely sedentarist interpretations of geographically-based 'place', but also the primacy of place in the constitution of social relations and societal structures.

In many examples of social and cultural theorisation liminality has served to displace a dominant binary logic, in terms of identities and subject-hood such as black/white and self/other. In architecture and urbanism liminality has often assumed a metaphoric role in the service of describing spaces deemed to have escaped—purposefully or otherwise—the binary logic of inside/outside, private/public, and below/above. In sociologist Sharon Zukin's (1991) opinion, liminality offers "the only possible perspective" to understand a loss in distinction between the spheres of culture and commerce and the ambiguous—thus liminal—landscape of postmodernism (1991, p.28). For Zukin, liminality operates as a lens to draw into focus the changing relationships between economic, social, cultural, and urban conditions that she argued had taken place in America since the mid 1970s onwards.

Zukin acknowledged that her application of liminal theory differed from Turner's anthropological use, writing that "[i]nstead of social groups experiencing moments of liminality...the liminal experience of the market is broadened so that new urban spaces are formed, permeated and defined by liminality. All such spaces stand "betwixt and between institutions…" (1991, p.41). More specifically, her use of liminality draws from its use in economic theory, including Jean-Christophe Agnew's[7] study and Joseph Schumpeter's concept of 'creative destruction'.[8] It is from Agnew's study that Zukin

[7] This references Jean-Christophe Agnew's (1986) publication *Worlds Apart* that describes a history of economic market culture, but also draws parallels between the developments of Anglo-American markets and theatre in the period 1550–1750.

[8] The concept of 'creative destruction' describes the essential force of capitalism as one of continuous change, where recurrent economic cycles, "…incessantly revolutionise the economic structure from

borrows the notion of framing the cultural and phenomenological experience of markets in liminal terms. Agnew described how in antiquity, the market-as-place gave significance to spatial and performative threshold rites in order to distinguish market activities from the traditional norms of society. Rites were enacted to provide a "…restraining wall of ritual and ceremony separating commodity transactions from other sorts of social exchange (Agnew 1986, p. 26). In layman's terms, this expresses the adage of not mixing business with pleasure.[9] Furthermore, while Agnew argued that markets, like theatres, are instruments of social reclassification, notably he reasoned that as *practice*s of commodity exchange are *temporary* they are better described as 'liminoid', rather than liminal (1986, p. 26).

The postmodern conditions Zukin sought to explain built on Agnew's identification of historical marketplaces as liminal, yet adopted liminality, and identified liminal spaces, in a different sense. While since the sixteenth century market culture had become steadily decentralised from (geographic) place, Zukin asserted that the forces of late capitalism signalled a more dramatic rupture and had produced new liminal spatialities. The formation of "hybrid public/private cultural forms", she argued had taken particular expression under late capitalism (1991, p.52), and this included concrete examples including "[t]he museum, the department store, and the waterfront shopping" as those that created liminality "by opening public space to private consumption" (1991, p.51).

In contrast to a vast number of interpretations from within the cultural and social sciences that adopt liminality to operatively lever open binary logics, Zukin's liminal spaces of hybridity and ambiguity represent a sense of cultural crisis. Her liminal space is a "no-man's-land", muddied by the ways cultural and social practices and understandings had become inextricably bound up in, and contingent on, market

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within, incessantly destroying the old one, incessantly creating a new one" (Schumpeter quoted in Zukin 1991, p.4).

[9] Agnew describes how the medieval marketplace was incorporated within a civic centre and operated to both visualise and contain the activities of commerce spatially and also legally through elaborate controls. The defined spatiality of the marketplace controlled the limits of its activity, keeping forms of exchange as marginal to ensure they did not supplant what were considered the central forms of exchange political, religious and social. (Agnew 1986, p. 22) Within this space that operated outside of the limits of hierarchical society, the marketplace came to operate as a "…vehicle of 'lateral connections", that inspired a form of group identity, or, as Turner theorises, communitas (1986, p.33). The marketplace was also the locus of festivals (adding a temporal boundary) where activities of resistance subsequently ensued to become a stage where the principles of surrounding society were actively mocked (1986, p.33).

practices (1991, p.269). While the identification of concrete examples of liminal space can neglect the richer significance of liminality as a transformational process, Zukin's liminal spaces represent a guise, as such spaces are not, in her view, culturally 'authentic', but rather, examples of a visual seduction to obscure the privatisation of "public culture" (1991, p.3).

Zukin's use of liminality is considered relevant here particularly in the way it draws focus to the problematic of permanent liminality. By definition, Turner's liminality is not a permanent condition or state. Given that its productive power lies chiefly in its transience, a more fixed or prolonged sense of liminality—or a spatial concretisation as in Zukin's use—can gesture instead towards crisis, obstruction, or a collapse of order. This highlights the less-appreciated vulnerability of liminality, and the potential for misappropriation when all prior frameworks, understandings, or social codes are lifted. Relatedly, Thomassen argues that liminality "…should not be considered an endpoint or a desirable state of being; when this happens, creativity and freedom lose their existential basis and turn into its opposites: boredom and a sense of imprisonment" (2012, p.31).

Similar to Zukin, Thomassen (2012) argues that the contemporary urban landscape is increasingly characterised by non-spaces. Yet, in ways different to Zukin, Thomassen criticises the description of ambiguous spatialities as liminal. When such spaces are celebrated as 'liminal', paradoxically, liminality becomes centralised and established as normality (2012, p.30). Further, he argues that "…liminal spatiality has become connected to the commercialization and intensifying social and political control of exactly such spaces, annulling their transformative potential while flattening our mental and physical landscapes" (2012, p.31). Ultimately, he suggests that while the contemporary urban landscape may be characteristically ambiguous, classifying places as liminal merely diverts attention from the contested arrangements of privately-owned-public-space.

Broadly speaking, and as has been discussed here, in the social and culture sciences as well as in architecture and urbanism, liminality has become synonymous with notions of hybridity. What constitutes hybrid space for Zukin (1991) are the conflation of sites, practices and experiences of commerce and culture, and the emergence of privatised-

public space. Yet, she concedes that the condition of "…liminality between public and private urban spaces…began in the nineteenth century", and notably, pointed to various technologies of movement, both literal (train transport) and informational (mass media), as chief protagonists. In this sense, and understandably, technologies are implicated in the problematisation of existing practices, but also, and necessarily, long-standing views and understandings. Shields reflected that "[t]he greatest power of digital virtuality…has been in providing a matrix in which *new* modes of being and practices of becoming could be experimented with" (2003, p.13, my emphasis). Yet, this discussion reflects the specificities of the technology of-the-time as it represents internet engagement as merely a temporary "leap from the concrete to the virtual" and implies it is largely inconsequential (p.13). Emphasis is given to how, as a liminal space, new identities are formed; yet in a digital virtuality such identities can only be experimented with, thus constituting liminoid-al space. Shields further states that "virtual spaces are 'liminoid' in that they are participated in on a temporary basis, and distinguished from some notion of commonplace 'everyday life'" (2003, p.13).

Framing the historicisation of virtual space as a shift *from* liminal-to-liminoid spaces operates as a vehicle of critical questioning. This implies that what was previously virtual was a technologically-unmediated other zone—a liminal zone in the ritual anthropological sense. With the advent of the internet and its development as "…more and more a pay-per-view, pre-screened information service", Shields argues that *ur*-liminal spaces are lost, and that digital virtual spaces constitute the degradation of the virtual. So, where Zukin saw the conditions of late capitalism as having *produced* liminal spaces, Shields argues that the same forces have in fact eradicated the liminal. Shields' subsequent claim that 'digital virtualities' thus constitute liminoid spaces equally hinges on common perceptions of early internet use as characterised by secretive online identities and (illicit) behaviours that are the exception to the everyday and the notion of a bi-directional information flows.

Despite describing the internet as a "pre-screened information service", Shields recognised the recursive aspects of engagement in and with digital virtual spaces. He noted that the "virtual rebounds on the material and the abstract" and in so doing, complicates simple dualisms and shift towards a "system of hybrids" (2003, p.14). On the ways digital virtual space stood to impact urban and architectural form, he asserted

that "[t]he virtual shifts the commonsense notions of the real away from the material", as, from an organisational perspective, it is "more heavily invested with notions of collective performance and *inhabitation* than a priori architectural objects such as 'the factory' or 'the office' "(p.14).

More recently, and in ways that actively oppose suggestions that engaging with ICTs leads to a move away from the material or the real, hybrid space concepts alternatively describe an interaction and layering of the 'real' and the 'informational'. In relation to contemporary mobile technology practices, Sherry Turkle (2008) theorises a new condition of intimacy with contemporary digital communications devices that bring into being a "new state of self" (p.121). She argues that, this new self as "attached to its devices, occupies a liminal space *between* the physical real and its digital lives on multiple screens" (2008, p.122 my emphasis). Extending the implications of a new digital selfhood to urban space, Turkle points to shifts in inhabitation, observing that "[i]ncreasingly what people want out of public spaces is that they offer a place to be private with tethering technologies" (2008, p.122). Consequently, she asserts that "…neighbourhood spaces themselves become liminal, not entirely public, not entirely private" (p.122).[10]

2.7 Discussion

Collectively, the case examples discussed in this chapter indicate the wide-ranging applications of liminal theory for re-thinking various contemporary conditions, subjects and scenarios of transformation. Liminal theory provides a processual view of transformation and thus a structured way to examine it. Furthermore, and in ways particular relevant to this thesis, as opposed to reducing the notion of transformation to states of before and after, liminal theory introduces a critical 'other' space. Turkle's interpretation of liminal space in relation to mobile technology practices continues the tradition of adopting the notion of liminality to introduce third or other spaces in ways that complicate the Enlightenment tradition of simple dualisms. Yet, in Turkle's case, the notion of liminality is merely the descriptor of a so-called new hybrid state of self,

[10] The train station is again cited here as a key architectural typology whose programmatic definition is problematized by contemporary digital device use.

as well as the condition of the spaces that mobile technology practices play out in, rather than a space in which extant conditions can be called into question.

Describing contemporary urban space in liminal terms has limited productivity, yet what is considered more useful for this thesis is engaging the categorical tensions introduced by the concept of liminality itself. The critical value of the notion of liminality is found in evaluating transformation and in reconsidering the interrelationships between mobile technology practices and the representation of urban public space along a spectrum that spans from liminal to liminoid. Furthermore, and in ways aligned to Zukin's use of the liminal, this views the conditions of hybridity and ambiguity as not necessarily constructive nor an endpoint, but rather as spaces-in-crisis. In Zukin's use what is liminal is not a new hybrid condition—as more recent spatial re-theorisations connected to mobile technology practices suggest—but rather it is the performative guise of cultural authenticity that operates to obscure the privatisation of "public culture" (1991, p.3). This liminal space is a "no-man's-land", muddied by the ways cultural and social practices have become inextricably bound up in—and in the manner of the trickster figure—commandeered by and enrolled into the wider capitalist project (1991, p.269).

Where Zukin saw the conditions of late capitalism as having *produced* liminal spaces, Shields argues that the very same forces have eradicated *ur*-liminal space, as the virtual has become commodified. In this way, Shields ruminates on what is lost when virtual space—once quintessentially understood as a ritual anthropological space and recently translated to a computing context—is deemed to have infiltrated the real and become commonplace. This sits in contrast to early internet use and 'digital virtualities' that were characterised by secretive online identities and (illicit) behaviours as exceptions to the everyday that Shields' cast as liminoid spaces. Given the shift to Web 2.0 since the mid 2000s, the advent of mass user-generated digital content, and the ubiquity and 'everydayness' of mobile technology practices what distinguished these practices as liminoid-al for Shields arguably is no longer valid. According to both scholarly and popular opinion mobile technology practices are now considered very much commonplace and everyday and the virtual has infiltrated the real. Mobile technology practices can thus be seen as liminal triggers as they operate, not as liminoid-al cultural

disruptors, but rather in ways that are managing people through a more gradual process of transformation, that assimilates them into a new regime of control.

Chapter 3: Defining public spaces

> *"…the history of a concept is not wholly and entirely that of its progressive refinement, its continuously increasing rationality, its abstraction gradient, but that of its various fields of constitution and validity, that of its successive rules of use…" (Foucault 2002, p.5)*

According to Turner's liminal theory, the purpose of the liminal or middle phase of transition and transformation in ritual processes is to 'release' ritual subjects from normality. This is reasoned to enable the deconstruction of "…'uninteresting' constructions of common sense" (Turner 1977b, p. 68). In withdrawing from normality, the liminal phase is further argued to be a 'space' of cultural scrutinization (Turner 1977a, p.167). In this thesis, the notion of liminality is invoked as a critical lens to unpack the sometimes analysis-resilient discourses associated with traditionally hegemonic disciplines and ideologies. More specifically, this chapter unfolds various definitions as well as normative assumptions related to the concept of urban public space. This intends to provide a conceptual basis by which a more critical examination of the so-called transformation of urban public space in relation to mobile technology practices can be made. Particularly, this foregrounds discourse primarily from within the built environment traditions that critiqued the conditions of urban public space during the 1980s and 1990s. Collectively this discourse reflected a commonly held view that the postmodern era was heralding in the 'end of urban public space'. Subsequently, this established the prime conditions for both nostalgic imaginaries as embedded in urban policies such as the Charter of the New Urbanism (CNU) (1999), but also a wave of opportunity for technologically-driven solutionism. This chapter considers how, while the postmodern public space crisis both identified and decried the shifting boundaries of public and private space, by contrast in more recent scholarship, the problematisation of the public/private dichotomy is a celebrated epistemic shift. Understanding how the concepts of public and private space are differently understood and engaged illuminates how the public/private debate is variously interpreted, and highlights the operative nature of disciplinary thinking. This further underscores the need for interdisciplinarity approaches.

3.1 Thinking publicness for a post-electric age

In the Western tradition urban space has long been organised around the notions of public and private space. This simple binary logic is best reflected in Giambattista Nolli's 1748 map of Rome that graphically renders a distinction between *res publica* and *res private*. In an urban and architectural context, the Nolli map is a popular graphic approach to describing and categorising urban space, and it remains a powerfully dominant representation that connects physical-material spatiality with one of the most

significant dichotomies of Western thought, the public/private distinction. The Nolli map, and figure-ground representations like it cleanly reduces the complexity of the built environment, as well as the concepts of public and private, to a palatable simplicity. Yet a governing logic is required to determine what is to be deemed public and what is to be deemed private. In this case, it is the nature of property ownership that renders 'private' space distinct from cultural and government buildings, as well as the spaces between buildings that are understood to be 'publicly' owned (e.g. state, government, or crown land) and accessible. In this way, the Nolli map reflects a logic of the organisation of urban space, but taken on its own, it does not explain the conditions, qualities, or significance of its spaces.

The question of public space has been long-debated in a diverse range of scholarly traditions, yet is one that has more recently become further complicated (Staeheli and Mitchell 2007). Somewhat paradoxically, Staeheli and Mitchell (2007) argue that the growing body of discourse—both scholarly and policy-based—exploring the concept of public space has equally served to further complicate it. From this discourse emerge multiple and differentiated ways of 'seeing' and understanding public space. From Rosalyn Deutsche's (1996) perspective, the possibility to see public space in many different, and potentially, conflicting ways, is an inherent characteristic of what it means for a space to be public. In sketching out public space's relationship to democracy, Deutsche argues that the complication of its definition is an essential characteristic; public space should always be a question. Given this, the various ways spaces are understood as public and private will be explored in this chapter, not with the intention of arriving at a singular definition, but rather to establish the foundation to explore what is at stake in the more recent representations of public space, and of publicness, that are bound up in technourban imaginaries that centralise mobile digital technologies.

The approach here is genealogical (Foucault 2002), that is, a range of perspectives on the concept of public space will be considered in order to illustrate how its meanings are subject to contextual (disciplinary and locational), and historical variation. This evokes Jeff Weintraub's (1997) description of undertaking a process of "conceptual self-awareness", that seeks to uncover the informing premises and doctrines of a concept (p.38). Equally, and with respect to the liminal theoretical framework that this thesis adopts, a process of conceptual self-awareness is analogous to the function of the

liminal phase in Turner's tripartite ritual process theory (see chapter 2). As per the liminal phase, the removal or suspension of prior conventions or consensus of meanings is sought here. Opportunistically, liminal action aspires to a 'release' from normality to allow the possibility to deconstruct the "…'uninteresting' constructions of common sense" (Turner 1977b, p. 68). In this way, liminality can be seen as a mode of revealing, of seeing things anew, and in the context of this chapter, of problematizing representations and understandings of urban public space.

Certainly, as Staehli and Mitchell attest, "…it is no longer adequate to [only] equate public space with open or accessible space", as is typical in the urban and architectural tradition (2007, p.792). Deutsche (1996) points to the incompleteness of physically-based understandings, arguing that while physical urban sites such as parks, urban squares, streets or cities can be public spaces they are not self-evidently public nor are they the *only* public spaces. This further points to questions of for whom any given space might be perceived, and moreover, experienced as public. Deutsche's observations concern the legacy of public space in the new world, that is, in Western, post-colonial, and non-European cities. In the context of new world city planning, public space is largely understood as a democratic construct. This is, as Deutsche argues, democracy's paradox. As democracy advocates for a collective sense of power in a heterogeneous and unfixed (moving) social body, power then cannot be located in any one person or sub-group. With the locus of power as indeterminate and unidentifiable, Deutche reasons that as a result society invented an alternative: public space (1996, p.273).

As an 'invention' of democracy and the by-product of modern democratic ideology, public space renders visible, but also tactile—in both a socio-material and physio-geographic sense—an abstract concept that is otherwise intangible. It is from this perspective that Deutche (1996) reasons that practices of publicness—in the democratic sense—can, and conceivably have, always occurred across a range of sites that are not necessarily geographically locatable or materially representable. That there exist plural and variegated sites of publicness is to understand public space in a less geo-located sense, and alternatively, as a set of institutions where people can engage in debate.

The conditions of contemporary urban living, such as large-scale cities, global mobility, transient populations, and a pervasive digital culture further complicate the conflation of civic practices and political culture with material urban settings. Echoing Deutsche's position, and critiquing the propensity to conflate democratic ideals with urban public space, Ash Amin (2010) writes that "[w]e are far removed from the times when a city's central public spaces were a prime cultural and political site" (p.6). Alternatively, Amin (2010) argues, contemporary conditions have influenced the production of plural and distributed civic and political formations. Civic practices and micro-politics are now locatable in a diverse range of sites from work, school, and the neighbourhood, to on-line communities and social networking. This is echoed by Varnelis (2012) who offers the concept of "networked publics" as a "post-public sphere" definition that describes a collective of like-minded, yet geographically dispersed individuals who are able to come together online (p.14). Somewhat controversially, Amin suggests that given this new variegated field of civic and political formation that urban public space has become of "secondary importance" (2010, p.6).

Understandably, the built environment traditions continue to place significant value on the role of physical public space to foster sociability, civic culture, and active political engagement. In the early 1990s as ICTs were entering the mainstream, many scholars associated this with a decline of urban public space. Others such as Carr et al., (1992) took the marginally alternate view that ICTs would lead to a sort of resurgence for urban public space. Chiefly, this understood the consequences of teleworking as a displacement or reconfiguration of public and private space, and consequently the renewed role of urban public space as a site of leisure and respite from technology.

In a present-day context Matthew Carmona (2015) notes that "urban public spaces have become urban policy tools of a much wider and pervasive significance" (p. 373). A renewed recognition of cities as engines of economic growth has resulted in both government and corporate re-investment and the elevation of urban public space as a "weapon[] in the arsenal of global and local inter-city competition…" (Carmona 2015, p.373). Perhaps not coincidentally, in parallel to a growing interest in the economic value of placemaking in cities, urban public space has become an increasingly important concern for a number of fields not traditionally concerned with the built environment including communications and media studies, and computer science and its allied fields.

In the discourse emerging from these fields the dominant technourban imaginary positions mobile technology practices as those that will reinstate social, civic, and democratic ideals, and thus publicness, while at an individual level, it is argued they *enhance* the interpretive experience of urban public space, and its meaningfulness.

The next sections of this chapter will outline a range of definitional frameworks that set out conditions for conceptualising the public/private distinction as well as reflect on the ways the broader postmodern project of breaking down the boundaries of common understanding has contributed to complicating these definitional models. More specifically, claims to the potential for public space's repatriation through technology is compared here against the narrative of crisis and loss that dominated public space discourse in architecture, urban studies, and sociology, from the mid 1970s onwards. Revisiting postmodernism's end of public space debate is considered relevant for this research as many of the themes of critique are argued to remain applicable to contemporary technourban imaginaries.

3.2 Public/private distinctions

The notions of public and private are far from simple terms as they can mean different things in different disciplinary contexts that when compared may be disparate and conflicting. Equally confusing are the multiple possible affixes that attach themselves to the public/private binary, including terms such as interest, sphere, space, and realm, are often used interchangeably. In this research the terms 'urban' and 'space' bookend the concept of 'public'. While the term 'urban' alludes here to the physical and material built environment of the contemporary city, and the term 'space' is far more extensible and encompasses both spatial and aspatial forms and condition, the term 'public' is a particularly nebulous concept that is more often defined in relation to its binary other—'private'. From this perspective, a number of scholars have surveyed a vast range of literature on the various definitions of public and private space. Notably, from a socio-political perspective this includes Benn & Gaus (1983) and Jeff Weintraub (1997) who have addressed the various ways the distinction between the public and private domain can be arrived at.

Weintraub's (1997) approach to defining public and private space is considered to be particularly useful in this research as its categories address both spatial and aspatial

forms. Weintraub describes four key discursive fields in which the public/private dichotomy are commonly interpreted as including liberal/economic, classic/civic, social/dramaturgical, and feminist perspectives. In the liberal/economic model the public is seen as the municipal/state administration and the private as the market economy. This model is primarily concerned with public policy and everyday legal and political debate. In the classical model, the public is seen as a political community and citizenry as distinct from the private, which is seen as the realm of both the market and municipal/state administration. Weintraub notes that this model corresponds to the civic perspective advanced by both Hannah Arendt (1998) and Jürgen Habermas (1991). In the social or dramaturgical model, the public is a realm of sociability, and this approach is concerned with analysing the cultural and dramatic conventions that make the social realm possible. Finally, the fourth model identifies the public as a larger economic and political order in contrast to the private as the familial/domestic. This model was common in feminist analysis as it highlights the ways females have been actively excluded from representation in the public realm.

Another example that seeks to clarify the public/private distinction is offered by sociologists Mimi Sheller and John Urry (2003), who outline five distinct ways that the boundaries of the public/private distinction can be drawn. The first concerns the state versus individuals, families and large corporations, the second describes the public sphere as place of rational debate and a social space that resides between the private space of the family and the space of the state. The third category distinguishes the private life of the domestic realm from the public life of politics, the workplace, religion, and education. The fourth category refers to public space as areas and locales, such as in cities that are regulated spaces, as distinct from the private space of the home and the workplace that are unregulated. Finally, the fifth description adopts the terms publicity and privacy that are distinguished through the lens of mass mediated 'exposure' (2003, p.110).

More recently, urban studies scholars Zachary Neal and Anthony Orum (2010) define urban public spaces as "all areas that are open and accessible to all members of the public in a society, in principle though not necessarily in practice" (p.1). Building on this, Neal (2010) describes three key approaches to defining public space as legal-economic, socio-spatial, and political, that are, he argues, distinguishable by their

"origins, assumptions and foci" (p.1). Ascertaining a public space's degree of 'publicness' is posed as a series of questions. Who pays for it? Who manages it? What does it look like and how is it used? What is its role in relation to democracy? Others, such as Jeremy Németh and Stephen Schmidt (2011), extend this further by establishing methods by which to assess the spectrum of publicness. Elsewhere, a review of public space literature by Kurt Iveson (2007) has distilled the approaches to conceptualising public space down to a "topographical" approach that emphasises geographical and physical features, and a "procedural" approach that considers how space can be "put-into-action" as a site of political and democratic practice (p.3).

In both academic discourse, as well as popular media, overwhelmingly the political perspective that Weintraub (1997) describes as the classic/civic interpretation remains a favoured approach to defining public space. This is particularly expressed in the discourse on the 'new-world' cities of American and other post-colonial contexts, where the function of public space has been most strongly tied to the expression and representation of modern democratic ideologies (Boyer 1995, Deutsche 1996). The reading of public space as a significant realm of sociability is often enfolded into the classic/civic perspective resulting in a hybrid socio-political public space. The physical co-location of people in public space is seen as positively serving social interaction by affording exposure to others—to difference and the chance of (productive) conflict (Arendt 1998). In this sense, social interaction, exchange, and dialogue, are often depicted as synonymous with political representation and action, and thus civic culture.

3.3 The socio-political conceptualisation of public space

Within the built environment traditions, the socio-political conceptualisation of public space has been typically advanced by scholars with reference to several key thinkers and texts, including Hannah Arendt's *The Human Condition* (1998), Henri Lefebvre's *Le Droit à la ville* (Right to the city) (1996), Lyn H. Lofland's *A World of Strangers: Order and Action in Urban Public Space* (1973), Richard Sennett's *The Fall of Public Man* (1993), Jürgen Habermas' *The Structural Transformation of the Public Sphere* (1991), and, more recently David Harvey's *Right to the City* (2008). The public realm of the ancient Greek polis, and in particular the agora, figured prominently in Arendt's (1998) discussions on collective, performative, and participatory democracy. Habermas

(1991) modelled his concept of the public sphere on the communicative action and reasoned logic fostered by the proliferation of coffee houses and salons in eighteenth-century Europe. Meanwhile, Sennett (1993) placed emphasis of the type of public life afforded by the scale and structure of pre-industrial feudal societies.

Grounding the abstract concepts of political action, civic culture, and social order in (antiquated) spatial examples is a powerfully communicative rhetorical device. For Arendt, Habermas, and Sennett, communicating the ideas of publicness through historic examples served as a particular way to critique the impacts of mass culture on civic formation and the practice of democracy, and more broadly a critique of modern society. While these narratives of publicness communicate abstract values, they are told through situated examples. Yet, the ideas of publicness, as made manifest through these specific, historic, and moreover, concrete examples, have often been taken to affirm the primary role of the built environment, and of public space, in the constitution of civic and political life. In a spatially determinist way, the agora, and the model of the pre-industrial village particularly, are often positioned as proto-typical examples of public space for comparison with contemporary urban spaces. By example Dijkstra's (2000) reading of the Arendtian (1998) 'public ream' actively conflates an abstract political model with a physically situated space. The "physical arena" he argues "is where culture and politics takes place", and thus "[H]aving truly public spaces is necessary for a democracy and can create a more tolerant society" (2000, p.1-2).

The normative expectation that a city's central urban public spaces are prime cultural and political sites is a narrative that has historically been pursued by urbanists and policy-makers alike. In Carr et al. (1992) public space design is described as the "special responsibility to understand and serve the public good which is only partly a matter of aesthetics" (1992, p.18). According to Carr et al. public space should be "*responsive, democratic,* and *meaningful*" (p.19). Expanding on this, responsive environments are described as serving the needs of their users, to provide "comfort, relaxation, active and passive engagement, and discovery" (p.19). In this context, passive engagement is said to "promote individual well-being and community" (p.19). Democratic space is interpreted here as pertaining to the rights of 'user-groups', yet is equally argued to be accessible to 'all', to permit freedom of behaviour, yet with the ability to claim "temporary ownership of a space", and in the Arendtian sense, to foster

tolerance of others or strangers (p.20). The distinction between public and private space is determined here on the basis of these perceived freedoms, with the home and the work place distinguished as the location of 'less free' activities.

Conflating the abstract concept of publicness with the form, scale, and assumed interactions of, for example, a pre-industrial village carries particularly symbolic weight and is reflected in contemporary expectations of public space as well as more recent technourban imaginaries alike. Notably, it was media theorist Marshall McLuhan (2003) who in the mid 1960s coined the phrase "the global village" as a metaphor to describe how electronic technologies could catalyse a re-organisation of the boundaries of social order and interaction (p.106). Yet, rather than imagining 'new' ways of living, the affix of the 'village' here gestures to his assertion that electronic-age would entail a 'de-Westernisation' and 're-tribalisation' of the world (2003, pp.32, 105). While McLuhan predicted that new electronic or digital informational mediums would become increasingly central to the re-organisation of human-technology-spatial relations, nonetheless normative expectations of village-scale sociality remained in play. McLuhan saw the medium of electronic technologies as a *reunifying* force, capable of addressing what he considered had become a "specialist and fragmented" civilisation (2003, p.106).

Evoking the village metaphor is a discursive and rhetorical device. The concept of a village often suggests smaller-scale spaces, social groupings and interactions, all of which are geographically grounded and generally limited in extent. In a sociological sense a village is notable for characteristics such as human proximity, interaction, interpersonal awareness, attention and intimacy, yet equally it may also suggest nosiness, suspicion, and a limited or reduced sense of privacy. It is also typically associated with a societal model of social interaction and collectivity. With a prefix of global, the village is reimagined as expansive, both geographically and quantitatively. In the global village social connection is enabled through the medium of electronic technologies rather than proximity extending well beyond a geographically defined spatiality. Drawing on a familiar and established concept such as a village communicates a generally positive notion of technological progress, where it becomes, in a sense, more palatable. The global village posits a new condition, yet equally evokes a sense of intimacy, homeliness, connectedness, and familiarity.

In the context of contemporary Western society, the village model is positioned in opposition to the industrial and post-industrial city and urbanisation more generally, that are commonly associated with conditions of anonymity, isolation, individualisation, and social polarisation as advanced by a long lineage of theorists of urban modernity including Simmel (2005), Benjamin (2002), Jacobs (1992), and Sennett (1993). Given the village is typically associated with a romanticised version of pre-industrial socio-spatial organisation, the concept of the global village can be interpreted as nostalgic, ideological, and safe, or perhaps, cautiously futuristic.

McLuhan's global village concept describes how new technologies, and particularly electronic or digital technologies, can be radically transformative, yet it is the subtheme of technology-as-redeemer and as a restorative medium capable of reinforcing or reinstating certain ideals of social order that is of particular interest here. Similarly, a dominant way that mobile technology practices are argued to transform urban public space centres around the maintenance, and in many cases, the restoration of classical and dramaturgical models of public space (Weitraub 1997). From this perspective, numerous studies claim that mobile technology practices can afford on the one hand, new ways to build sociality and community, and on the other, new ways to increase civic attentiveness and political participation. These claims tacitly accord with the view that urban public space is no longer legitimately 'public', or that as an architectural and urban project, public space has failed.

3.4 The postmodern crisis of public space

The assertion that contemporary urban public space has lost its 'traditional' qualities and that these might be restored and redeemed *through* technology, is an argument that is contextualised here through three key premises. Firstly, this argues that public space's so-called decline and abandonment as reflected in the narratives of crisis that dominated the urban and architectural discourse of the 1980s and 1990s established the prime conditions for the more recent nostalgia-driven responses and technological determinism alike. Secondly, a commitment to golden-age examples of public space and the ideals they represent has continued into the present day. This is problematic as prototypical examples of urban public space are often misleading romanticised, and present a "sanitized image of history" (Madanipour 2010, p.7). Thirdly, the growing

global competitiveness of cities and the ensuing trend towards place-branding and/or placemaking since the 1990s has elevated public space to a prime neoliberal project that encourages new modes of consumption.

The seeds of contemporary nostalgic imaginings and technological opportunism can be located in the commentaries around the conditions of urban public space from the 1980s and 1990s that advanced notions of a crisis of urban public space. This period, that followed a global recession in the mid 1970s, heralded a critical turning point in the discourse on cities and ideas about urban public space. Overwhelmingly, the discourse of this era that is replete with nihilist tendencies, also reflects a crisis of confidence in the thinking on cities and city life. Adrian Franklin describes how the "…optimism and confidence about finding the means to produce ever-better cities gave way to anxiety and pessimism" (2010, p.75). As an antidote to a sense of loss, various scholars and commentators subsequently sought solace in recalling more 'authentic' examples of publicness from "golden ages and golden sites" (Crawford 1995, p.4). Lamenting the so-called loss of public space in the postmodern city net a virulent form of urban public space nostalgia, that as Mona Domosh describes built on "different threads of … cultural criticism and political theory that posit[ed] connections between the decline of the democratic, public sphere and the disappearance of public spaces" (1998, p.209). As the end of urban public space appeared to be a *fait accompli*, much of the discourse appeared to be more concerned with identifying the catalysts behind the epoch marking shifts and transformations of cities rather than offering any solutions. Making sense of rapid changes and defining epochs, characterised in economic parlance as the shift from 'Fordist' to 'post-Fordist', and more generally, 'modern' to 'postmodern', subsequently occupied a great many scholars (Ellin 1996; Cybriwsky 1999).

In the built environment traditions, the architectural and urban projects of the 1980s were subject to vitriolic critique. This was typically underscored by key empirical and observational studies that identified areas within large-scale North American cities as key sites of transformation and urban decline. This included for example Greenwich Village in New York City as told by Jane Jacobs (1961), and later M. Christine Boyer (1992), Mike Davis' (1992), Edward Soja (1989; 1995) and Margaret Crawford's (1995) attention to Los Angeles, and Anastasia Loukaitou-Sideris and Benerjee's (1993) research on San Francisco. Likewise, analysis undertaken by Don Mitchell (1992) on

the People's Park in California, and Sharon Zukin (1995) who analysed various parks in New York City, served to uphold the view that under late-capitalism public space in Western cities had become "less public" (Zukin 2010, p.111).[1]

The critique of the postmodern urban and architectural landscape was advanced under a number of key themes including: citizenship and democracy, commodification and consumerism, privatisation and securitisation, and gentrification (Jacobs 1961; Lofland 1973; Goldberger 1987, 1989; Zukin 1987, 1991; Loukaitou-Sideris 1990; Boyer 1992b, 1995; Davis 1992; Fisher 1992; Smith 1992; Sorkin 1992; Sennett 1993; Koolhaas 1995; Mitchell 1995; Low 1997). Common to each of these themes is the subject of the eroding or shifting boundaries of public and private space. How this shift or erosion can be reasoned is of course entirely contigent on how the often nebulous concepts of public and private space are defined. Typically, these accounts describe the characteristics of 'authentic' public space as both spatially and socially open, inclusive, and accessable, and most significantly, that public space is invulnerable to the jurisdiction of 'private' interests, corporate or otherwise.

3.5 Public space nostalgia

In response to the end of public space crisis, nostalgic views of public space, and of urban environments more generally, flourished. The dominant urban imaginary of the 1980s was heavily influenced by Jane Jacob's (1992) ideal vision of contemporary urban life described as the 'urban village' (Zukin 2011). This urban imaginary evokes qualities and characteristics of publicness associated with a smaller scale agrarian-based societies. Equally there were repeated calls called for cities to return to more 'traditional' public spaces and practices, and this extended as far back to the golden ages and golden sites of the Greek agora, the coffeehouses of early modern Paris and London and the New England town square. These examples were held to be places where a cohesive public discourse had once thrived (Crawford 1995, p.4).

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[1] The examples cited here indicate the extensive body of research on the conditions of urban public space in North American cities. In similar ways many post-colonial cities, that were planned and evolved during the industrial era, lack the *longue durée* of European cities, yet their planning approaches also aspired to characteristics of the European urban planning tradition. Boyer (1995) and Deutsche (1996) have each referred to how the conception of urban public space in American and post-colonial Western cities such as in Australia, tend to more strongly associate urban public space with the expression and representation of modern democratic ideologies.

Deference to European traditions and places has a long history in the design and planning of new world cities. Equally, adopting golden-age examples as a vehicle for criticism is common strategy evident in examples such as Camillo Sitte's (1889) comparisons of medieval towns and the modern city in *City Building According to Artistic Principles*. While deferring to historic European precedents may have fallen from favour during the modern period, as confidence in the modernist project waned towards the second half of the twentieth century they again regained prominence. For example, figures such as Sigfried Giedion argued that the means to a "broader life" would be more fulfilled in the institutions of the "Greek gymnasion, the agora, the Roman thermæ or forum, the guilds, the mediæval market places or cathedrals", as such places, he argued, "were never conceived of as financial investments" (1944, pp. 565-566).

Neo-traditionalist sympathies gained further traction amongst architectural theorists and critics towards the second half of the twentieth century as evidenced by Aldo Rossi's *Architecture of the City* (1982 [1966]), Leon Krier's article "City within the City" (1977), and Rob Krier's *Urban Space* (1979) wherein he claimed "…modern cities [had] lost sight of the *traditional* understanding of urban space" (1979, p.15 my emphasis). Here Krier undertook a comprehensive study of the spatial characteristics of existing and pre-existing—largely European—urban public places, to comprehend why twentieth century urban planning appeared to be so "impoverished" (1979, p.17). Yet, significantly these investigations and their positions address the work of urban and city planning professionals, rather than an understanding of how users might value urban public spaces.

While architectural theorist and critic Charles Jencks described a "renewed interest among architects in the idea of the public realm", in his 1987 introduction to the *Architectural Desig*n journal issue on the Phoenix Municipal Government Center, he cited the Greek agora as a key design precedent (p.7). Significantly, his argument centred on the perception that new media technology, namely television, necessitated renewed attention to spaces of co-presence. He argued that *res publica* (Latin for public things) must "provide a place for people to congregate and be convivial, form opinions and enjoy themselves", and "it must…have the equivalent of an *agora* or outdoor room,

where the spontaneity of political action can emerge and the people can feel their collective power" (1987, p.7 my emphasis).

Adopting the measure of golden-age places such as the agora meant that the wave of new public buildings, corporate plazas, atriums, and arcades, subsequently fell well short of popular and critical opinion. In this vein, Paul Goldberger regarded new corporate plazas, atriums, and arcades as "artificial substitutes for a *true* public realm" (1989, p.2 my emphasis). Chiefly, however, he levelled the blame at the Reagan administration in America, proclaiming that economically–led political dispositions had triggered a complete devaluation of the public realm (p.2). Stating a truism, Goldberger further wrote that the urban condition could not be "more different from the ways things were half a century ago" (p.2). Others such as urban and architectural critic Michael Sorkin (1992) pointed to the 'artificiality' of newer urban developments in American cities, yet more specifically singled out the shopping mall as in-authentic behemoths that would herald-in the 'end of public space'. Speaking to the authenticity of public spaces, he recalled the parks of Paris, Savannah—the oldest city in America—and the Greek agora, castles and piazzas, as examples of 'authentic' public spaces of the pre-modern world (Sorkin, 1992: xii). Also critical of the newer shopping mall trend, critic Mike Davis described the "new mega-structures and super-malls" as actively against the ideals of openness and accessibility, commonly regarded as quintessential public space attributes, that he argued, were better expressed in the 19th century "Olmstedian" vision (1992, pp. 226-227).

With the so-called positive attributes of historic public spaces oft-exaggerated, the 'undesirable' characteristics were often omitted. The Greek agora, the medieval marketplace, and the "modern agora" of Jacob's New York City Greenwich Village (Sennett 1996, p.355), represent examples that were neither wholly inclusive, nor accessible by all, yet they are often idealised as socially ordered but also diverse, stable but also dynamic, and politically active but also safe urban spaces. Ironically, as Sennett (1996) points out, the open 'public' space of the Greek agora provided for the common political activity of ostracism, in other words, the practice of exclusion. The agora was inaccessible to all but the affluent 10-15% of the population who were granted 'citizenry', and excluded all women from entry and participation (Ruddick 1996, Sennett 1996). Likewise, while the eighteenth century European coffee houses and

salon societies may have projected a politically charged atmosphere of communicative action, they also lacked social diversity, consisting mainly of an educated and literate class (Neal and Orum 2010, p.5-8). Furthermore, while the 'commons' of the medieval period referred to land worked by the commoners, they remained wholly owned and controlled by the Monarch. Additionally, that the typical Renaissance market square emerged by virtue of being a centralised point of trade and commerce is less discussed.

What the reference to these examples reflect is conceptual cherry-picking. For example, the association of European coffee houses with democratic engagement is associated with the views of Habermas (1991). Yet referencing these material places did not intend to advance them as models for public action. From Habermas' perspective, the European coffee houses represented a critical point of transformation, the moment when discursive action simultaneously created the seeds by which it would thus be destroyed. What each of the aforementioned golden-age examples do share are commonalities in spatial and social scale as well as constitution, that is, they were made up of a largely homogeneous population. By virtue of their smaller scale, societies were generally able to congregate in a common central space that combined economic, social, cultural, and political practices. The centralised market squares of European and agrarian based villages typify this ideal public space model and provide an obvious and distinct counterpoint to the increasing scale and complexity of post-industrial cities.

Despite the shortcomings of 'traditional' public space precedents, the 1993/1994 Charter for the New Urbanism (CNU) (2000) effectively canonised urban public space nostalgia. In responding to the postmodern narrative of loss and crisis, the CNU called for smaller scale, denser, compact, and "clearly bounded communities" (Kelbaugh 1997, p. 142). Its key principles argue that "[c]ivic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy" (CNU 2000, p. 341). Furthermore, "each neighbourhood should be defined by a public space and activated by locally orientated civic and commercial communities" (de Villiers 1997, p.30). Significantly, while the charter emphasises public over private values and of notions of 'community', it also clearly denounces digital technologies.

The CNU explicitly called for a return to the ideas, patterns and planning scales that had prevailed *before* the automobile spread cities apart, and before television, "kept us inside our houses, and before telephones and computers reduced face-to-face interaction" (quoted in Kelbaugh 1997, p. 142). According to the CNU, strengthening the public realm could be achieved by privileging face-to-face interaction and physically defined places over electronically mediated realities and privatised spaces (Kelbaugh 1997, p. 143). This is a view perpetuated by scholars such Robert Putnam (2000) who pointed to the private act of TV-watching as a driver in the decline of participation in public life.

Critics of the CNU have pointed to the incompatibility of their proposals with contemporary conditions. Philosopher Slavoj Zizek stated "…with its return to small family houses in small towns, with front porches, recreating the cosy atmosphere of the local community…this is the case of architecture as ideology at its purest, providing an imaginary…solution to real social deadlock which has nothing to do with architecture and all with late capitalist dynamics" (2011, p.244-278). Similarly, Habermas identified such strategies as deliberately escapist, adding that as "traditionalism falls under the heading of political neo-conservatism…it redefines problems which are of a different level, in terms of questions of style, thus removing it from the consciousness of the public" (Habermas 1997, p.222). Furthermore, Deutsche has argued that the "image of coherent social space perpetuated in the new urban-aesthetic discourse is a fantasy that harbors its own spatial politics" (1996, p.xix). Likewise, Harvey (1997, 2008) describes the nostalgia mode of CNU as a deflective act that operates to disguise the primary economic interests of the middle-class.

The urban imaginaries that advance concepts such as the 'urban village', are far from neutral fantasies. As Lofland (1973) well argues, translating the village ideal to contemporary urban contexts can render it void of its prior positive attributes. When removed from its unique historical context and applied to a large-scale contemporary city, the village can alternatively signal withdrawal, spatial cloistering, and the deliberate segregation of people (Lofland 1973, p.135). The formerly positive ideal of tight-knit communities associated with the village, in a contemporary context can alternatively be read as exclusionary, closed, and defensive. In this way, neo-traditional

urban imaginaries become complicit in the very practices they claim to refute. On this, Harvey asserts that,

> *"[h]arking back to a mythological past carries its own dangerous freight…New Urbanism in fact connects to a facile contemporary attempt to transform large and teeming cities, so seemingly out of control, into an interlinked series of "urban villages" where, it is believed, everyone can relate in a civil and urbane fashion to everyone else…The "spirit of community", has been historically deployed as a conceptual weapon against social conflict and in this way the image of the village too becomes a vehicle of (state) control" (1997, p.2).*

3.6 Public enemies

Despite having clear antecedents in earlier eras[2] the shopping mall is widely represented as the antithesis to, and nemesis of contemporary urban public space. Yet, beyond its less-than-appreciated status in architecture and urban studies, the significance of the shopping mall to this thesis is in how it came to symbolise a new consumer-driven society (Jameson 2003, p.67). In this way, the shopping mall is not only a consumer-designated space, but a space that constitutes the postmodern consumer subject. As Fredric Jameson (2003) notes, the shopping mall is particularly synonymous with "Americanization…postmodernization…globalization" (p.69). In particular, the large-scale, opaque, enclosed, and spatially introverted shopping malls that characterised the postmodern era have served to materialise and spatialise the abstract concept of capitalism in ways that provided a more tangible target for its critique. And in this way the shopping mall became a public enemy.

As privately owned, yet publically accessible, shopping malls as well as corporate plazas have been described as inauthentic, inadequate, and illusory replacements of more genuine public spaces. Given their patronage, it has been popularly argued that public life is being drawn into the interior, a claim that echoes the fear of a growing trend towards individualism, a societal retreat from public life, and in short, the

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[2] Judd (1995) refers to Kansas City's Country Club Plaza as the first modern shopping center built in the United States in 1923, he further argues the first enclosed mall opened in Edina, Minnesota in 1956 (p.146). Fredric Jameson (2003) describes the spatial originality of shopping malls as one that can be traced to the nineteenth-century arcades of Paris, and even further back to the 7000 BC 'city of Catalhöyük (p.67). Walter Benjamin (2002) describes the Parisian arcades as the "forerunners of department stores" (p.3).

introversion of space (Davis 1992; Sennett 1993; Low and Smith 2006).[3] Yet, argued from another perspective, the popularity of shopping malls suggests a shift in societal preference to private and segregated spaces, as well as shifts in what it might now mean to be 'in public' (Christopherson 1994, p.412). In a more perverse way Koolhaas argues that "[s]hopping is arguably the last remaining form of public activity" (quoted in Foster 2001, p.5).

While in one sense the popular claim that public life had been drawn into the interior amplifies a perceived division and conflict between private and public space, in other ways new consumer practices call into question long-held notions of public and private space. In this way, for better or worse, scholars argue that the urban experience has been, and continues to be, remade through cultures of consumption (Boyer 1988; Jameson 1991; Crawford 1992; Christopherson 1994; Manfredini and Jenner 2015). Yet, while for many consumer practices are cast as a vulgar fetishism of the material, others pointed to the ways they can be understood as cultural practices in their own right. The central question here however remains choice. Are people freely choosing to engage in consumer practices, as is the common assumption of leisure pursuits, or does the heavy hand of capitalist logic drive habitual and addictive tendencies, offering a guise of choice in a carefully controlled setting? These questions are particular relevant to this thesis, when considering how in a contemporary sense, consumer practices have in many ways shifted to the digital sphere. This is evident in two key ways. Firstly, this concerns how contemporary (physical) retail environments are engaging emerging technologies not only in terms of indoor positioning systems to track human movement and the service provision of (free if your register) wireless internet, but also in the creation of a complementary digital experience (Manfredini and Jenner 2015). Secondly, and relatedly, retail and consumer services are becoming increasingly tailored for mobile platforms (Wilken and Goggin 2014).

[3] Rem Koolhaas took these views further in his criticism of shopping malls in the publication *A Harvard Design School Guide to Shopping* (Chung et al., 2001). "Shopping is arguably the last remaining form of public activity. Through a battery of increasingly predatory forms, shopping has been able to colonize—even replace—almost every aspect of urban life. Historical town centers, suburbs streets and now train stations, museums, hospitals, schools, the internet, and even the military, are increasingly shaped by mechanisms and spaces of shopping" (Chung et al., quoted in Foster 2001, p.5)

A large body of discourse has pointed to how mobile technology practices complicate the boundaries of public and private space and remake the urban experience, less emphasis is given towards the ways they afford new ways to *consume* urban public space. From a position of intense critique Sharon Zukin (1991) described the postmodern conflation of social and cultural activities with the 'private' spaces of consumerism as significantly problematic. To underscore this concern, she theorised these so-called hybrid conditions as signifying the emergence of 'liminal' spaces. In her interpretation, liminality was an undesirable state as ambiguous spaces evade clear description, purpose, and meaning. In short liminal space puts into a crisis the possibility of *shared* meanings that, in her view, constitutes a sense place (Zukin 1991, p.51). From an equally critical position, Boyer describes consumer culture as transforming cities into 'imagescapes' for the display of commodities. With reference to New York's Times Square, Boyer has previously argued that in the way the practices of global capitalism lay claim to urban territories, that they remake them only in the interests of marketability (2000, p.37).

Elsewhere consumer practices and their spaces are critiqued for inhibiting socio-economic diversity, and thus in the Arendtian sense, they lack diverse representation, and the appearance and possibility of difference (p.50).[4] From an extreme perspective, William H. Whyte (1988) argued that such spaces produced a racial and class-based polarisation, and a form of "spatial apartheid" (p.203). Equally, Loukaitou-Sideris and Banerjee (1993) have described how the private provision of open public space, namely corporate plazas and arcades, appear to be public yet on closer inspection subtly promote exclusionary principles (p.10). More recently, Voyce (2006) has argued that contemporary shopping environments continue to operate on the principles of exclusion, rather than inclusion (2006, p. 280). Equally, Zukin continues to assert that, more

[4] Arendt states that the "term "public" signifies two closely interrelated but not altogether identical phenomena: first … appearance—something that is being seen and heard by others as well as by ourselves—constitutes reality" (1998, p.50). "Second, the term "public" signifies the world itself, in so far as it is common to all of us and distinguished from out privately owned place in it" (1998, p. 52) Dijkstra notes that to Hannah Arendt, "the term "public" …refers to the political community" (2000, p.6) Arendt is customarily depicted as a theorist of the public, yet *The Human Condition* places equal emphasis on and advocates for the importance of the private realm in shaping people for participation in the public realm/sphere. Arendt argues that "…mass society not only destroys the public realm but that private as well, deprives men not only of their place in the world but of their private home, where they once felt sheltered against the world and where…even those excluded from the world could find a substitute…the Roman people, who unlike the Greeks, never sacrificed the private to the public…on the contrary understood that these two realms could exist only in the form of coexistence" (1998, p.59).

generally, "[p]rivatised public space … tends to reinforce social inequality" (2010, p.128).

In defence of consumer spaces, and privatised-public spaces more generally, three key points can be made. Firstly, as Paul Goldberger (1989) has previously described, it is often tacitly *expected* that a municipally managed public space should be directly concerned with addressing and fostering social objectives, yet by contrast private corporations are actually under no obligation to do so. This point alludes to how places and practices can be held to expectations and ideals that they are not necessarily related to. In other words, the critique is misaligned to the subject. Secondly, is it assumed that activities undertaken in privatised-public spaces are routinely taken to be more 'private'. And building on the second point, thirdly, this assumes that civic and political ideals can only be fostered under certain conditions of ownership, namely those that remain free of 'private' interest.

3.7 Consumerism[5], privatisation, and securitisation

Both the mainstream media and scholarly critique of shopping malls and corporate plazas has relied strongly on the key premise that the practices of consumerism are overwhelmingly private concerns divorced from public and political significance or influence. In this sense, consumer practices are seen as separate to, or apart from, public culture, and furthermore, are framed as antithetical to civic and political concerns (Voyce 2006). Where consumer practices are assumed to be a-political, this naturally reinforces the expectation that activities of the public realm or the public sphere belong in only specifically designated public spaces.

Yet, as far back as the nineteenth century, Charles Fourier observed that despite the commercial aims of Parisian shopping arcades, such spaces transcended merely the accommodation of consumer activity, and also functioned as "places of habitation" (quoted in Benjamin 2002, p.5). Furthermore, Michel de Certeau (1984) offers the alternative position that consumerism is not a passive culture, but rather a tactic of

[5] Paul Glennie notes that the terms 'consumption' and 'consumerism' are defined in various disciplinary contexts in different ways, some of which are contradictory (1998, p.928). Glennie adopts Campbell's (1985) definition of 'modern consumerism' as the "general orientation to the accumulation of goods, the display of consumption and an unceasing search for novel experiences " i.e. social positioning (1998, p.928).

resistance to deflect the power of dominant orders. In other ways, scholars such as Daniel Miller (1987) have theorised the significance of consumer practices and in people's relationship to things as a shift towards a material culture. Similarly, Nigel Thrift and Paul Glennie (1996) have drawn focus to how the "many diverse ways of spending time and/or money…[are] experienced as sociable shared activities…not merely momentary financial transactions" (Glennie 1998, pp.928-929), while Meaghan Morris' (1999) oft-cited essay "Things to do with shopping centres", establishes shopping centres as sites of 'authentic' cultural experience. Similarly, from an urban and architectural perspective, prominent thinker Paul Barker describes shopping malls as a cultural phenomenon, arguing that "[w]e must try to understand, not just condemn [them]" (1999, p. 104). Refuting the notion of newness and noting their clear antecedents, Barker noted that while the "concept of the British malls may be American, in many ways, their design flows directly from, on the one hand, Victorian arcades and, on the other hand, from the enclosed fun-fair…" (1999, p.104).

Outlining the postmodern critique of shopping malls serves to draw out two main points. Firstly, this relates to how the so-called authenticity of urban public space can often be a matter of preference and taste over moral values. As Christopherson well points out "…what looks like an inauthentic Disneyland-like environment to one person may look like fun to another" (2004, p.412). Secondly, the qualities of urban public space that many critics adopt as their measures are often ideals that never existed to begin with. This is described by others as the discursive production of 'phantom' and illusory public space (Robbins 1993; Deutsche 1996). In ways relevant to current technourban imaginaries, these nostalgic and phantom notions of urban public space often function as strategic tools that conceal ideals, and in this way should not be dismissed as merely illusory (Loukaitou-Sideris 1990; Jameson 1991; Boyer 1992b; Crawford 1992; Judd 1995). After all, nostalgia has been a key vehicle in promoting large indoor shopping environments identified as 'urban villages', and with often oblique references to history in their architectural forms (Boyer 1992). Along these lines, Judd (1995) has argued that shopping mall developers deliberately projected an image of a "medieval city fortress" as it contains powerful layers of intimation (p.152). Particularly, this includes notions of an organically formed and self-governed 'community' beyond the control of an external authority (p.145).

On the other hand, shopping malls are also marketed as alternatives to, rather than replacements for, more 'traditional' or 'authentic' forms of public space such as parks and gardens (Loukaitou-Sideris 1990). By promoting them as convenient, comfortable, secure, safe, and thereby 'desirable', external urban public spaces such as streets and parks are, by contrast, rendered risky, unsafe, and unpredictable. As sociologist Zygmun Bauman has aptly summarised, "[s]hopping malls make the world (or the carefully walled-off, electronically monitored and closely guarded part of it) safe for life-as-strolling" (1996, p.27). Extending this, Crawford describes American shopping malls as "fantasy machines" deliberately marketed as a more convenient escape from the 'real' world (1992, p.23). Boyer has argued that the mega-mall marked the beginning of a "new language of urban design" where prescriptive spaces are designed as "…landscapes of pleasure intentionally separated from the city's more prosaic or threatening mean streets…places that offer a diet of synthetic charm that undermines critical evaluation" (1993, p. 119).

Once more, the postmodern critique of privatised public spaces directs us back to notions of authenticity, and of 'real' or unmediated experiences, which, several scholars suggest, are only possible in more genuine public spaces (Virilio 1994). In this way, the quality of spatial experience is equated with perceived freedoms, and moreover, the way a space is managed or controlled. Judd makes frequent reference to the pre-shopping mall spaces as reflecting more "organic processes" of societal and behavioural control (1995, p.146). Shopping malls and urban plazas in 1980s adopted newly available forms of electronic surveillance, that were seen as more oppressive regimes of control (Judd 1995). Yet, in doing so, they were not only responsive to changing urban conditions, but also the "…technological advances that…allowed more sophisticated and unobtrusive surveillance over larger areas…" (Christopherson 1994, p.413). That municipally-managed public spaces, such as streets and parks, offer more freedom than bureaucratically managed privately owned public spaces, reflects little recognition of the regulatory frameworks imposed by municipal bodies, and more significantly, how tacitly understood social rules of order can also institute powerful forms of inclusion and exclusion.

Subsequently, it is not a question of *whether* public spaces are controlled, but rather, whose norms define and determine those controls (Domosh 1998, p.211). From a

sociological position scholars such as Lofland (1973), Sennett (1990, 1993)[6], Bourdieu (1990), and Domosh (1998) have each addressed how social norms and codes have historically operated as forms of control that were more seamlessly embodied in everyday life. This includes protocols of style, decorum, and etiquette communicated through facial expression, speech habits, dress, and comportment, that were once the dominant modes for managing social relationships. In the pre-industrial city these "appearential" forms of control once clearly dictated the permissibility of interaction between people of different backgrounds and classes in urban space (Lofland 1973). Lofland describes this form of appearential ordering as how "[s]ocially defined differences among persons were emphasized in costuming, in body markings and in language" (1973, p.45). Yet, with the disintegration of feudal order and the increasing scale of industrial, and later, post-industrial cities, *appearential* order became severely weakened resulting in the shift towards more *spatially-based* mechanisms of social order (Lofland 1973, p. 48-60). Lofland argues that the new *spatial* order—including the concept of urban zoning—was conceived by the newly emergent—and anxious—middle class who sought to distinguish and "insulate themselves from others" (1973, p.91)[7]. This view aligns with Domosh who notes that "the early modern city was defined by and for middle and upper-class white men" (1998, p.211).

Bourdieu's writing on social class equally describes how social codes ranging from language, drinks, automobiles, holiday resorts, and clothing provide:

> *"the small number of distinctive features which, functioning as a system of difference, differential deviations, allow the most fundamental social differences to be expressed almost as completely as through the most complex and refined expressive systems available in the legitimate arts" (1984, p.226).*

Similar to Lofland and Domosh, he asserts that "classificatory systems" of society "are not so much a means of knowledge as means of *power*, harnessed to social functions

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[6] Sennett's theme of a societal retreat from public action centres on a theory of public expression that he describes over a three-century survey, thereby contrasting the capitalist-consumer society with the late-feudal period. Sennett's concern here is to articulate the attitudinal transformations over this period of time and how the 'style' of urban public life shifted with the move towards industrial capitalism. This is a comprehensive account of urban life that encompasses a wide range of material conditions from speech habits, dress, and behavioural codes (1990, 1993).

[7] Lofland cites three significant instruments of spatial order instituted by the middle class to protect their interests as: the modern form of the police force in London in 1829, zoning practices in urban planning and "humanitarian" organisations (1973, p. 90-91)

and overtly or covertly aimed at satisfying the interests of a group" (1984, p.477 my emphasis).

3.8 Public, private, and other spaces

Putting aside the spurious claims of inauthenticity, what the postmodern critique of a new range of privatised-public spaces illuminated were how long-standing notions of order were being re-invented. In short, the orderly and palatable notions of public and private space were coming to be understood as far more complicated. For Zukin (1991; 1995), consumer practices transformed a space *from* public *to* private-in-public and thus produced liminal or ambiguous spaces. From this perspective, festival marketplaces, museums, theatres, performing art centres, public events, street fairs, parades, and celebrations, were no longer wholly public—as if they ever were—and were regarded as compromised by private interest (corporate sponsors). For Zukin, Boyer, and others, this epitomised how, in late capitalism, the built environment had become vulnerable to the "asymmetry of power favouring [the] private sector" (Zukin 1991, p. 52-53).

Yet while many scholars pointed to global economic restructuring and socio-spatial change in cities and urban public space, from a sociological perspective Lofland (1973, 1998) drew focus to the ways that changes in the *communication* of social information could more immediately influence people's perceptions of the built environment and of notions of public and private space. Lofland's theorisation of social space offers a phenomenologically-orientated approach to the problematic of the public/private space dichotomy and thus a different set of logics related to its transformation. Here, a person's social association and informational accessibility[8], is seen as central to a perceptual transformation of space. Lofland outlines three key scenarios as those that influence a shift in the perception of space from public into a private or semiprivate space for an individual: (1) the creation of *home territories*; (2) the creation of *urban villages* (home territories writ large); and (3) the creation of temporary mobile "homes" by means of the *traveling pack* (1973, p.118).

[8] Lofland describes her theorisation of urbanites as a "generalist sociology" that does not focus on particular urbanites, or specific cities (1973, p. xii).

According to Lofland, how a person accumulates information and knowledge is key to the way they form perceptions of people and places. As information is made available to people, through appearential (social) and/or spatial (situated) ordering, forms of familiarity are developed and subsequently spaces are more likely to be used/occupied for 'private' purposes (p.122)[9]. Lofland further refined this socio-spatial definitional framework, following Albert Hunter (1985), as public, private, and 'parochial' realms (1989; 1998). Hunter's (1985) earlier analysis of social order and control in urban neighbourhoods had sought to counter claims that modern communities were eroding by expanding the public/private dichotomy. Adapting Hunter's concept, Lofland described the public realm as a non-private sector urban area where co-present individuals are personally unknown to each other (1989, p.19). By contrast the private realm is a highly familiar space "characterised by ties of intimacy", while the parochial realm is "characterised by a sense of commonality" – such as acquaintances, the workplace and neighbours (1989, p.19).

This definitional framework positions *information* as a central driver to the *perception* of privacy, and thereby also the perception of publicness. From this perspective, "the more knowledge [possessed], the less the setting is an alien place full of strangers, the more it begins to feel like home" (Lofland 1973, p.122). Lofland further reasoned that when this "knowledge approaches maximum, in detail, completeness, and certainty, the setting ceases to be…an urban public locale at all" (1973, p.122). This acknowledges that privacy—interpreted as exclusionary in the postmodern sense—operates at socio-individual levels in perceptual ways, which further suggests that forms of control, bureaucratic, corporate, municipal, or otherwise, are never the sole determinants of perceiving publicness or privateness. As Lofland notes, the individual *alone* cannot transform the character of public space, rather, they can "transform the character of [their] social psychological relationship to that space…by controlling gestures, facial expression, movements, and so on", and in so doing, the individual can create "…a symbolic shield of privacy" (1973, p.140).

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[9] See for example Henderson who also analysed public settings in terms of the different ways people enact forms of privacy, she adopted the terms "claim", "territory", and following Goffman (1963), "personal space management" (1975, pp. 446-447). Privacy in this sense is defined as the "inaccessibility to another" in other words the strategies employed to prevent interaction with co-located persons.

Differentiated ways of seeing public space are also articulated through Don Mitchell's study of the 'People's Park' in Berkeley, California. While in some ways his work could be viewed as advancing an 'end of public space' position, his adoption of a Lefebvrian (1991) lens operatively draws out both common and differentiated ways of seeing public space in contemporary cities from the perspectives of various users *and* policy makers (1995, p.115). Mitchell's case study particularly illustrates how a theoretical approach can expand the understanding of public space to multiple subject positions. With Lefebvre's trialectic model, the conventional subject-object division is displaced, as the triad interconnects both abstract and material spaces. In this way space is understood as fluctuating, and an interactive *process* of negotiation between conceptions (representations of space made by designers, planning authorities), perceived bodily experience (spatial practice), and lived space-in-use (spaces of representation/representational space). For Mitchell applying this spatial triad served to illustrate how "[d]efinitions of public space and 'the public' are not universal and enduring; they are produced rather through constant struggle in the past and in the present" (1995, p.121).

Lofland's sociological theory of private, public, and parochial space and Lefebvre's theory of the social production of space are considered significant to this research in the different ways they lever open the binary logic of public and private space. Particularly, as Lofland's theory centralises the role of information in the perception of space it finds continued reference in more recent discourse that addresses the role of ICTs and mobile technology practices in the changed perceptions of urban public space (Humphrey 2011; de Waal 2011b, 2014). What each of these theories points to are the multiple, co-existing and often contested views of space that, when taken into account, present a dynamic continuum of publicness and privateness.

3.9 Post-public space

It has been argued that to comprehend the postmodern landscape, and by extension urban public space, necessitates the development of a new form of perceptual equipment (Jameson 1991). Along these lines, various scholars in the mid 2000s positioned mobile technology practices as not only the new perceptual interfaces to understand the conditions of the twenty first century, but also those that could actively

transform the built environment. In this way, mobile technologies inspired a number of scholars to problematize anew, significant questions relating to the use, control, and meanings of urban public space. Subsequently, the long-standing understandings of public and private space as discussed in this chapter, are recalled in scholarship on mobile technology practices under a number of key themes including social organisation, citizen engagement, practices of attention, and the perception and production of meaning—historic, symbolic, cultural and otherwise.

Mobile technology practices are implicated in the deconstruction of the public/private binary, as well as the production of multiple and co-existing gradients of publicity and privacy, often referred to as 'hybridised' conditions. The discourse that outlines this so-called disruption is distinguished in this thesis as two distinct phases: pre-smart and post-smart. Chiefly, pre-smart discourse pertains to research that addressed the early impacts of mobile communications (see chapter 5), while 'post-smart' refers here to research that has addressed a host of new practices that gained popularity following the release of the Apple iPhone in 2007, a period during which 'smartphones' gained a much wider user base (see chapter 6 and chapter 7). The notion of post-smart discourse takes into account a significant shift in the affordances of mobile technology enabled by more sophisticated GPS technology and new software applications designed to facilitate 'location-awareness'. These technological developments have subsequently driven a pronounced shift in the context of internet engagement and activities, from static desktop-based computing to mobile computing. This has also meant the translation of many desktop-based software platforms such as *Facebook* (Crawford 2008; Wilken 2014), and significantly, many retail and service models, to mobile applications. In short, mobile technology practices are big business.

A notable example of pre-smart discourse that describes the impact of mobile communications on urban space is Kopomaa's (2004) study that recalls Ray Oldenburg's (1989) concept of 'third place'. This argues that mobile communication engagement creates a new type of space that is a place of withdrawal distinguished from either the home or the workplace, a third place (2004, p. 268). Alternatively, for Kenichi Fujimoto (2006) and others, mobile phone use operates to territorialise space. Fujimoto (2006) more specifically describes mobile phones as 'territory machines', capable of transforming a public space into a private space—for its individual user, and/or perhaps

far wider. Marking the shift into post-smart discourse, media communications scholar Adriana de Souza e Silva's 2006 paper "From cyber to hybrid: Mobile technologies as interfaces of hybrid spaces" theorises the impact of networked mobile communications on urban space. Here de Souza e Silva argues that socialisation through a networked mobile communications device that locates social contacts simultaneously in geographic and digital space transforms space into a hybrid condition. Conceiving of spatial transformation as hybridised is further echoed by mobile media theorist Jason Farman who has argued that "[c]onnecting with familiar spaces in a new way through mobile locative social media offers the potential for physical space to be transformed into hybrid space" (2012a, p.74) Farman further asserts that the use of a networked mobile device can "…collapse the space between public and private spaces" (2012a, p.71).

In still other examples that address the impact of mobile technology use in urban public space, emphasis is given to the ways that in a liminal sense, rather than producing 'new' conditions, mobile technology practices can reveal extant conditions. de Souza e Silva and Frith (2012) dedicate a book to outlining how the concept of 'privacy' is reimagined through the ways mobile technology practices help to filter, control and manage a user's relationship to public space. They argue against the common perception that the use of mobile technologies in public space constitutes an invasion of private engagement in public space, and instead offer that mobile technology use reveals the problematic nature of the public/private dichotomy. In this way, mobile technology practices are understood to recast public and private space in terms of the degrees of control they afford the user. From this perspective, where public space is seen as an unmediated space of information and strangers, private space pertains to the possibility of personalisation and interactional control. This suggests that the private-public continuum can be reinterpreted as from a state of being 'in control' (private space) to a state of being 'out of control' (public space).

In adopting Lofland's (1973, 1998) urban socio-spatial theorisation of public, private, and parochial space, both Humphrey's (2011) and de Waal (2011b, 2014) explore how mobile technology use produces conditions that cannot be described through the rigid concepts of public *and* private space. De Waal (2011b) argues that urban computing technologies more generally "force us to rethink some of the core concepts through which we understand and value urban life" (p.190). The concepts of public and private

space can, for example, be re-described through the ways publicity is encouraged and privacy is 'protected' in the digital sphere. This perspective adopts a parlance of sharing, searching, indexing, findability, and encrypting information (Jacobs et al. 2013, p.22). In this context private space is differently understood as a space (or person) that is 'not locatable' or 'not found' through an internet search engine either because this information is deliberately encrypted and made inaccessible or restricted, or digital information on that person or site does not exist or has been deleted. Conversely, public space is understood as a space or person that is indexable, searchable and 'findable'. This interpretation points to, not a transformation from public to private or vice versa, but rather an amalgam of oscillating conditions that produce differing intensities of publicness and privateness as mobile device users move through urban space. As, while a mobile device user may be physically situated in a space that is recognised by the city and its community as a 'public' space, that location and the mobile device user might be otherwise 'not-locatable', and thereby private in a digital sense.

The problematic of 'findability' is also an issue of technical and spatial complexity. While in many ways mobile technology practices can be argued to complicate the simple binary logic of public and private space, in other ways they acutely simplify it. Presently, the technologies that support a key feature of a smartphone's location-aware capacities are less advanced with respect to *indoor* environments, as for example shopping malls. From a locational-information perspective this renders outdoor spaces as generally findable and thus public, and indoor spaces as not-locatable and thereby private. GPS location-data is currently less reliable for accurate real-time indoor positioning systems in, for example, privatised-public spaces such as shopping malls. So, while much postmodern discourse identified shopping malls as hybrid privatised public spaces, the mobile technology practices render them private in an informational sense. Research on the technology for indoor positioning systems is a rapidly developing and lucrative enterprise, and is made possible through a wide range and combination of technologies including Wi-Fi, Bluetooth, RFID, and GPS. There are a number of ways that retail and service providers, as well as institutions such as art galleries and museums currently provide location-based information for indoor environments. Connecting to free Wi-Fi services via a mobile device within shopping malls, or dedicated applications (apps) can offer the user location-based information, yet

the corollary to this is that the user becomes findable and trackable. Thus, mobile device user and the shopping space are made public in the informational-findability sense.

In other ways the notion of a transformation of public space is discussed in an additive and restorative sense. As will be further outlined in chapter 5, a range of post-smart discourse claims that mobile technology practices *enhance* urban public space by making it more informational, more meaningful, more democratic, and in short, more 'public' (de Souza e Silva and Frith 2010; Foth et al. 2011; Farman 2012a). A growing body of scholarly work positions mobile technology practices as "the 'next big thing' when it comes to citizen participation and an apparently long-overdue revitalisation of democracy" (Galloway 2010, p.1). In this way, mobile technology practices are seen as an overwhelmingly positive contribution to the conditions and perceptions of urban public space. As opposed to separating us further from more 'authentic' experiences of urban public space, they are widely argued to offer augmented, enhanced, enriched, and enlivened experiences.

This chapter has outlined various public/private definitional frameworks and has examined accounts of the loss of, and shifting balance between, public and private spaces in urban, architectural, and sociological discourse. This discourse critiques the postmodern landscape, yet in ways that reflect the growing unease with the loosening of normative and rigid understandings of the public/private binary. Often such critiques were directed at newly built shopping malls and corporate plazas, that while accessible to the general public, are owned and managed by private interests. This thesis holds that these examples were erroneously evaluated against nostalgic ideals of public space, and against values that they had made no particular claim to in the first place.

Nonetheless, the postmodern public space loss narrative pointed to significant cultural shifts, and the necessity to rethink how public space could be understood and valued. The question of public space continues to be a key theme in discourse that has addressed the relationships between technologies, people, and the built environment, and the loss-narrative is similarly expressed in this context. In ways similar to Zukin's opposition to gentrification and the loss of local place-identity, Castells (2009) initially theorised the impact of an extensive digital information space as that which would erode the spatially embedded value of cities. Similarly, and as will be further discussed in

chapter 4, several theorists in the 1990s, such as Paul Virilio, painted an often bleak picture of the prospects of urban public space in a digital age. Yet, at the same time a growing body of discourse also began championing the potential for ICTs to address issues of urban regeneration and improving the competitive edge of cities in a global context (Aurigi 2006). Mobile technology practices have become central to the narrative of regeneration under smart city strategies and urban public spaces are now seen as key sites in the economic revitalisation of cities more broadly. As urban scholar Ali Madanipour (2011) has noted, ICTs are now positioned by non-scholarly and non-technical sectors, in short, governments and corporations, as the "life-blood of the information economy, the path to innovation and higher productivity" (p.90). As such, the longstanding focus on 'production' as the measure of successful cities has been reframed through practices of digital placemaking. Cities and their public spaces have become targeted sites for the deployment of technologies in the service of larger economic objectives (Glasmeier and Christopherson 2015, p.4).

This reflects a key shift in thinking, from framing public space as under threat from new modes of corporate financing and privatised ownership such as the shopping mall, to situating ICT-based approaches, and more specifically mobile technology practices, as central to their restoration and thus positive transformation. In a very recent paper on the potential for Interaction Design applications as 'placemaking' approaches, the narrative that urban public space has deteriorated is unquestionably accepted (Deshpande 2016). Moreover, this is supported with a single reference to Setha Low's (2006) discussion of how stringent management practices are restricting access to existing public spaces and thus diversity. While Low's paper is cited to underscore the opportunity for digital technology applications, Low also points to the changing perceptions of technology in relation to the built environment. She writes that where the technology of closed circuit television (CCTV) was "once considered 'Big Brother' technology and an infringement of civil rights", it is now considered to be part of a necessary arsenal of safety and security measures that are significantly under-examined (p.45). In this sense, the rhetoric of 'public good' provides a strong alibi for technological opportunism in ways that can forestall critical engagement (Boyer 1995; Deutsche 1996). Where one discipline sees the opportunity to communicate, interpret, and re-make the built environment through mobile technology practices, another view

must ask in what way does this transform urban public space into ever more expansive sites of incessant consumption?

Chapter 4: Technologies of space/spaces of technology

"Technology" is a slippery term, and concepts such as "technological change" and "technology development often carry a heavy interpretive load" (Bijker, Hughes and Pinch 1987, p. 3).

"Technology is rooted in the past. It dominates the present and tends into the future" (Mies van der Rohe 1971, p.154.

"The astonishing fact that one thinker after another has stumbled upon is merely this: technology in its various manifestations is a significant part of the human world" (Winner 1977, p.6).

The exploration of the relationships between mobile technology practices and urban public space is now a complex field of inquiry, or a 'post-field', constituted through a diverse range of academic traditions, theoretical perspectives, and research methods. This chapter situates the contemporary discourse that addresses the relationships between mobile technology practices and urban public space within a broader historical trajectory of thinking technologies in and for the built environment. This outlines how ways of thinking technology within the popular imagination, philosophical tradition, and disciplinary contexts, has transformed significantly since the mid-twentieth century. While critical thinking about the impact of technologies for society and urban life has entered more fully into the collective consciousness over the previous century, this chapter draws into focus how architectural and urban discourse has, by contrast, maintained a distinctly instrumentalist approach to conceptualising technology. The examination of this discourse highlights how particular interpretations and applications of twentieth century philosophical theories that link technology to the transformed meanings of space, including notions of embodiment and human/nonhuman relations, have significant implications for substantiating claims to urban transformation. This further reinforces the limited application of these conceptual approaches to the theorisation of the transformative power of mobile technology practices. This points to the necessity to develop alternate theoretical frameworks to reveal richer understandings of technologies more generally, and of the impacts of mobile technology practices more specifically, in and for the built environment.

4.1 Urban life, but not as we know it: sociotechnical perspectives

With reference to Marshall McLuhan's (2003) assertion that the city no longer exists[1], and perhaps also in reference to a great number of nihilistic postmodernist positions, architect and urbanist William J. Mitchell declared, "[y]es, yes, I know; it's a familiar trope—death of God, death of the subject, death of the author, death of the drive-in, end of history, exhaustion of science, whatever. But he [McLuhan] turned out to be right—though a few decades ahead of his time, as usual" (1999, p.3). In asserting this, Mitchell underscores how the long-standing role of the built environment in the mediation and

[1] Marshall McLuhan's position on the 'city' ceasing to exist pertained not to the notion of its physical eradication, but rather the diminishing significance of the physical city's role in mediating communication and influencing social and economic conditions.

communication of social and cultural information, and thus a fundamental notion of what a 'city' is, had changed. For Mitchell, the emerging landscape of ICTs stood to significantly reconfigure extant modes of information organisation, supply, and exchange in cities. Writing at the height of the dot-com era as microelectronics, computing (hardware and software), telecommunications, and media were converging, Mitchell argued that new modes of (design) thinking were required to address what looked set to become an increasingly technologically-mediated urban life.

Framed as a series of eulogies for the Western city, Mitchell regarded existing urban patterns to be incompatible with a future digitally-infused city. With ICTs set to be increasingly integrated with everyday practices, he argued for a re-think of the role of "public places, towns and cities for the twenty-first century" (1999, p.3-4). In speculating on both the negative and positive impacts that emerging ICTs could play in shaping future cities, he drew on examples of previous technology networks, including modern water supply and sewerage systems, electrical grids, and telecommunications. Particularly, the spatial and social relationships between these technologies and urban space were acutely drawn into focus.

Mitchell's thinking is significant to this research in a number of key ways, and chief among these is that he conceptualised technologies from a socio-spatial perspective. This approach recalls the social histories of technology as told by Lewis Mumford's *Technics and Civilisation* (1934) and Sigfried Giedion's *Mechanization Takes Command* (1948), that each presented the concept of technology as not simply a means of production, but also a way of thinking and being, and a significant force of socio-spatial organisation. While Mitchell drew on historical examples, his account was not historical, but rather forward-looking and questioning. His writing was framed around distinctly philosophical musings, as he asked what kind of life a technologically mediated-urbanism might portend?

Examining contemporary technologies in this way, while widely advanced in the social and cultural sciences, and particularly in the field of Science and Technology Studies (STS), is less common in the built environments tradition. This is not to say that philosophical positions on technology are left wholly unattended to, but rather that the job of philosophising is more often given over to oft-cited key figures such as Deleuze

and Guattari (1984, 1987), Martin Heidegger (1977), Jean Baudrillard (2006), Paul Virilio (1991, 1994, 1997), Jürgen Habermas (1991), and to a lesser extent Jacques Ellul (1964). As such, within the architectural discipline, Mitchell's extensive body of work—that includes a trilogy of publications *E-topia: Urban life Jim, but not as we know it* (1999), *Me++: the cyborg self and the networked city (2003)*, and *Placing words: symbols, space, and the city* (2005)—that drew into relationship the subjects of architecture, urbanism, and the emerging landscape of ICTs, while foundational, remained largely speculative in approach.

Others who have similarly offered perspectives on the nexus of ICTs and the built environment and who have vocational backgrounds in the built environment traditions, include Stephen Graham, Simon Marvin, Richard Coyne, Malcolm McCullough, Antoine Picon, Mark Shepard, and Anthony Townsend. Little more than a decade ago these scholars could have counted themselves among a select few, yet since then a wide and diverse range of researchers has addressed the subject of ICTs and urban public space in a host of ways. Particularly, a growing body of researchers allied to the so-called ubiquitous computing (ubicomp) paradigm, including computer science affiliates such as HCI, Interaction Design[2] (Moggridge 2007; Saffer 2010) and Urban Informatics[3] (Foth 2009; 2011), have set out to explore the potential applications for ICTs in the built environment. Additionally, communications and media studies researchers have also waded into this discussion, focusing more specifically on the relationships between the production of mobile media and its relationship to urban public space. In short, exploring the relationships between mobile technology practices and urban public space is now a complex field of inquiry, or a 'post-field', constituted through a diverse range of academic traditions, theoretical perspectives, and research methods.

This thesis recognises that while these diverse fields might deal with similar subjects their disciplinary frameworks of thinking necessarily differ. Of particular note are the

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[2] Bill Moggridge discusses how in the early 1980s the discipline emerged in line with the commercial availability of digital computing technologies and in response to a perceived skill gap between computer scientists with a technical and performance-based emphasis, and human factors and user-experience communities (UX) who focus on the psychology of the end-user (2007). In the early 1980s Moggridge saw Interaction Design as "the equivalent of industrial design, but in software rather than three-dimensional objects" (2007, p.14).

[3] Also referred to as Urban Computing (Galloway 2013).

ways the concept of technology can be variously understood in relation to society and notions of epoch-making change, and more specifically in relation to the scale of the body and in terms of human-technology relations. Significantly, differing interpretations have implications for substantiating claims to the transformation of urban public space. Particularly, and as is argued here, as the instrumental perspective of technology remains dominant in the built environment traditions, this plays a significant role in precluding a richer understanding of technologies in the built environment and of digital culture more generally.

4.2 The philosophy of technology

While technological perspectives can be traced as far back as the Greek origins of philosophy itself, critical thinking about the impact of technologies on society and urban life has entered more fully into the collective consciousness over the previous century and more formally as an established area of inquiry over the previous four decades. Several anthologies and historical surveys dating from the 1970s onwards document and substantiate a Philosophy *of* Technology that took shape over the course of the twentieth century. These publications address the meanings and (social) implications of technology and identify foundational scholarly contributions from the late-modern period onwards (Mitcham and Mackey 1972; Mitcham 1985, 1994; Ihde 1993; Aronowizt et al. 1996; Berg Olsen et al. 2008; Kaplan 2009; Hanks 2010; Scharff and van Dusek 2014).

Broadly speaking, discourse that more pointedly addresses the meaning of technology in a modern context emerged from two distinct traditions: the engineering discipline and the humanities. From within the engineering discipline researchers largely address the analysis of technology from the perspective of its formation or production. Conversely, humanities scholars have tended to bring a non-technical perspective to bear on the interpretation of technology. Philosopher Carl Mitcham (1994) notes that although both traditions were concerned with technology they differed in their approaches and

emphasis. As Mitcham has well noted, the key "challenge of difference is judgment" (1994, p.62). [4]

Don Ihde notes that prior to contemporary philosophers such as Martin Heidegger (1962, 1977), "technologies played at most background, illustrative, or epiphenomenal roles in philosophy" (2010, p.2). He further reports that even philosophers "came late to the Philosophy of Technology" (2010, p.4). Langdon Winner surmises the (postmodern) shift in attention towards technologies as a subject in its own right describing how,

> *"[a]fter centuries in which technical artifice was of little interest outside the confines of its own development and practice, the nature of man's own creations has now emerged as a source of genuine perplexity. The technological world that the scientific revolution helped bring into being has itself become a focus of new inquiry" (1977, p.5).*

He dryly notes that the "astonishing fact that one thinker after another has stumbled upon is merely this: technology in its various manifestations is a significant part of the human world" (Winner 1977, p.6).

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[4] German philosopher and engineer Ernst Kapp is regarded as one of the earliest scholars to apply a philosophical approach to thinking about industrial era technologies. In coining the term *Philosophie der Technik* (philosophy of technology) in 1877 Kapp argued that technological tools and weapons could be understood as different kinds of "organ projections" (Mitcham 1984, p. 74). For example, the railroad could be conceived of as an externalization of the circulatory system and the telegraph as an extension of the nervous system (Mitcham 1984, p. 74). Kapp saw in machines the possibility of generating opportunities to find genuine self-knowledge by creating an objective world (Ihde 1993, p. 29). German chemical engineer Eberhand Zchimmer also adopted the term 'philosophy of technology', yet he did so in order to defend technology against its critics, and to argue that the goal of technology was human or "material freedom" (Mitcham 1984, p. 75). Such positions also echo Francis Bacon's enlightenment call for person-kind to use any and all technology to achieve mastery over nature. As Mitcham points out, the goal of technology as "…human freedom achieved through and understood in terms of the material mastery of an escape from the limitations of nature", is a common theme that was epitomised by the era of space–race exploration in the 1960s and remains current today (1984, p.75).
A key figure in engineering-philosophy discussions that is argued to have further the dialogue on technology during the mid-twentieth century was research engineer and entrepreneur Friedrich Dessauer (Mitcham 1985, p.76). According to Mitcham, in the context of modern engineering Dessauer saw the primary discussions of technology as offering either the analysis of scientific knowledge, or the implications of such knowledge for human life, and viewed these as particularly limiting. Subsequently following Immanuel Kant's *Critique of Pure Reason*, he proposed an alternative and argued for the distinct power that new modern technologies posed for changing the way people relate to, and exist in, the world (Mitcham 1985, p. 76).

That technology became a subject of inquiry within its own right relates, ironically, to technological development. With mass media, the catastrophic force of military technologies in World War I and World War II, and particularly the deployment of atomic bombs in Hiroshima and Nagasaki, gained global attention. Over the course of the twentieth century the awareness of environmental degradation due to industrial pollution also grew, inciting a greater need to understand and articulate the impacts of technologies on the environment. In the 1970s the political ecology movement, especially in Germany and America, were significant vehicles of mass criticism and the rejection of technology. Val Dusek reflects that at this time "…luddite notions of machine smashing" were revived (2006, p. 4). From a humanist perspective, the devastation of the natural environment became the impetus to argue for, and defend the "…fundamental idea of the primacy of the non-technical" (Mitcham 1994, p.78).

Parallel to the mounting technophobic perspectives and the attendant promotion of notions of the 'natural' environment and organic processes, awareness that various technologies were catalysing new scientific discoveries and leading to improved qualities of life for many people equally grew. Significantly, over the course of the twentieth century as machinic processes led to significant scientific discoveries, the positivist tradition of understanding technology as the asocial application of scientific truths increasingly gave way to renewed thinking. With the mass production and general ownership of many 'technologies' that had been developed initially for use in military contexts—including the computer—levels of anxiety connected to technology's negative possibilities began to subside. Collectively these events and impacts spawned not only greater critical attention to the relationships between technologies, society, and the environment, but also a re-evaluation of the relationship between technology and ideas (Mitcham 1994).

Winner (1977) points out that the term technology itself is a relatively contemporary phenomenon, coming into more common use in both academic and everyday parlances over the course of the twentieth century. In this time the terms denotative and connotative meanings have proliferated to cover a diverse range of conditions from tools, instruments, machines, organisation, methods, techniques and systems (Winner 1977, p.8). On the common understandings of the meaning of the term Mitcham (1994) describes four key approaches including object-based (ontological considerations),

knowledge-based (epistemological studies associated with skills and techniques), action-based (methods of designing, inventing and manufacturing), and volition-based (decisions, choices and desires). Similarly, Bijker et al., (1987) categorise three key layers of meaning, including as a physical object or artefact, as an activity or process, and as "know-how"—the knowledge required to design and construct a practice, object or artefact (p.4).

On framing technology's relationship to and with society, David Kaplan (2009) offers four key—and competing—theories as neutrality, autonomy, determinism, and social construction. The theory of neutrality, or 'instrumentalism', refers to the ways technologies are seen as neutral tools that are independent of values. By contrast the autonomous technology argument is wary of technology, and predicts technology will, or has taken control of humans and is driving a technicized way of life where efficiency is the only end. This view advances technologies as those that will override traditional or competing 'human' values, and has been vividly rendered in numerous science fiction dystopias. On the other hand, technological determinism views technology as an historical driver and as the engine of change. From this perspective, technologies precipitate social developments and not the reverse. This is particularly expressed by periodized history in terms of ages such as the Iron Age, the Industrial Revolution, and the Information age.

Historicist accounts that are technologically determinist attribute epochs to specific technological developments. A lesser version of technological determinism that nonetheless follows a causal path, argues that technologies do not cause social change, but rather have a profound influence. Finally, the social construction of technology approach (SCOT) (Bijker, Hughes, and Pinch 1987) assumes a more neutral position and argues that society simultaneously shapes technology as technology shapes society (Kaplan 2009 p.xiv). As cultural anthropologist Mizuko Ito (2006) has noted in her research on everyday mobile communications practices, SCOT approaches "…posit that technologies are both constructive of and constructed by historical, social and cultural contexts, and [] argue against the analytic separation of the social and technical" (p.6).

Defining what precisely counts as technology is no easy task, and it is necessary to consider the disciplinary context in which any given understanding is being tendered.

As Picon reflects, seen in the long-view, technology can refer to the invention of writing thousands of years ago, along with the birth of Western philosophy, and can in many ways, extend to the entire history of building, tectonics, and cities (2010, p.16). In the context of architecture and urbanism, while the concept of technology finds multiple definitions and associations, the instrumental view often assumes a dominant position (Allen 1997; Vidler 1999; Hale 2012). Chiefly, this approach sees technology as pertaining to the 'tools' adopted in and for the practices of representation and production/documentation, but also more broadly as relating to the performance of built and urban materialities (building science). This position is evident in urban and architectural discourse where the question of technology is often subsumed within historicized and technical accounts of building systems, structures, and materiality. Anthony Vidler (1999) has argued that in this way the built environment traditions have actively cleaved discussions of technology from questions of urban and architectural space (p.483). Given this, the question of technology has been largely, and in many ways intentionally, held apart from considerations of the everyday structures of life, and of digital culture.

Given that, as Ihde (1993) reflects, even philosophers came late to a Philosophy of Technology, it is not surprising that philosophical questions concerning technology's relationship to society have been largely unaccounted for in architectural and urban discourse. Over the course of the twentieth century key figures, who began to critically appraise the relationship between technology and urban life and the relationships between emerging technologies and the built environment, include Lewis Mumford (1930, 1934, 1967, 1970), Sigfried Giedion (1948), and Reyner Banham (1960). While these—largely historicised—accounts relate chiefly to industrial machines, Mumford's (1930) article "*The drama of the machines*" bought a social and moral perspective to theorising technology's relationship to society. His follow-on publication *Technics and Civilisation* (1934) addressed debates around the machine's role in society that occurred following World War I. Mumford was wary of the 'de-humanizing' effects of modern technology, yet argued that a machinic sensibility preceded the advent and use of modern complex machines (1934, p.3).[5] As such, Mumford re-cast the beginnings of the

[5] In *Technics and Civilization* Mumford (1934) calls into question the generally accepted periodization of the *machine age*. He argued that the origins of the machine age had been popularly referred to as "the

industrial revolution as occurring in the middle ages as explanation for the readiness of modern culture "…to use new mechanical instruments" (1934, p.4).

What is considered significant to this research is the argument that in order to understand society, society needs to understand technology. Mumford understood that "to understand the machine…is also a means toward understanding society and toward knowing ourselves. The world of technics is not isolated and self-contained: it reacts to forces and impulses that come from…the environment" (1934 p.6). Yet, by the time of writing *The myth of the machine vol 2: The Pentagon of Power* Mumford's (1970) position reflected more than simply a healthy scepticism of technological promise. Here he described the technologies of electricity and the computer as intrusive, controlling, and tools of a more sophisticated contemporary version of slavery in the form of a centralized authoritarian technics. He questioned the pursuit of technological advances for their own sake, and the burgeoning forms of technocracy. Furthermore, he argued that these newer forms of technology facilitated the removal of citizen access to, and the accountability of government as "[i]n this new systems-centred collective, this Pentagon of power, there is no visible presence who issues commands" (1964, p.5).

Mumford's concerns are no less valid in the contemporary context of mobile digital technologies and they are foundational questions for developing a critical approach to the ubiquitous computing and smart city paradigms. While Mumford's work is widely appreciated in the architectural discipline, and his views have undoubtedly influenced architectural thinking around technologies, architecture's contemporary position on emerging technologies more generally is also well illuminated by revisiting Banham's perspective (1960). In doctoral work conducted under the supervision of architectural historian Nicholas Pevsner, Banham critically re-examined the architecture of Modernism and its relationship to technology during the late stages of the first machine-

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great transformation in modern industry from Watt's supposed invention of the steam engine; and in the conventional economics textbook the application of automatic machine to spinning and weaving …" (p. 3). He questioned the 'newness' of technologies, and put them into context with inventions from the tenth century onwards, in this way he argued that a lengthy cultural preparation for technological change and a readiness for the industrial revolution, had been at work in Western civilization for almost a thousand years. In reframing the history of technologies in this way, Mumford further fortified a cultural role for technology in human society that, in opposition to Karl Marx's technologically determinist position on the system of production and societal structure, instead proposed a co-constitutive framework. He further argued that the publication of *Technics and Civilization* "heralded a change of attitude among scholars towards the history of technics as an element in human culture" (p.xvii).

age. Indeed, the catalyst for Banham's research had been his scepticism of the technological determinism of the 1960s. He stated that,

> *"…what appeared to be a second machine age as glorious as the first beckoned us into the 'Fabulous Sixties' – miniaturization, transistorization, jet and rocket travel, wonder drugs and new domestic chemistries, television and the computer seems to offer more of the same, only better. What had been promised by the First Machine Age, but never properly delivered, now seemed to be at hand" (1960, p.10).*

While acknowledging the ways the Bauhaus doctrine had elevated and drawn inspiration from the developing technologies of the time, Banham noted that this had "left the theory and design of architecture permanently and irrecoverably changed" (1960, p.10). While the Bauhaus' design approach and outputs were—and remain—widely regarded as progressive, in his view the functionalist doctrine and machine-age aesthetic merely reflected a "superficial understanding of developing technologies and materials" (Langevin 2011, p.4), and therefore embodied a "mindless mechanization" (Banham 1960, p.11). In calling into question the machine-age ideology of the Bauhaus, Banham argued it had merely produced a new rational, minimalist, and clean style that solved none of the functional and social issues it purported to address.

The tendency towards the aesthetisation of technology, rather than its purposeful application trivialised architecture's engagement with emerging technologies. The British avant-garde group Archigram, the high-tech movement of the 1980s, and more recently so-called 'parametric'[6] methods, have attracted similar criticism that they have superficially—or less 'genuinely'—engaged with technology. On parametricism, Kazys Varnelis has suggested that it has served to "domesticate[] the force of the digital" (1996). In the built environment disciplines more generally, when not describing computational methods in design practice and in terms of form generation and digital fabrication, the subject of ICTs has more often been discussed in the context of radical and avant-garde groups.

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[6] Patrik Schumacher has advocated for 'parametricism' as the first real style since the Modern Movement (Burry 2010, p.18). See also Patrik Schumacher, *The autopoiesis of architecture: A new framework for architecture, Volume 1* and *The autopoiesis of architecture, Volume II: A new agenda for architecture*

The embrace of emerging technologies amongst various architectural groups and schools in the post-War period coincided with a time when the discipline itself also became a significant subject of interest from the outside and "an object of inquiry as an ideology" (Vidler 2011). Not coincidentally, these views also paralleled significant shifts in thinking in the social and cultural sciences from structuralist to post structuralist approaches. More generally, post-World War II was a pivotal period that saw a transition from Fordist to Post-Fordist modes of production, accelerated levels of mass consumption, global economic re-structuring, increased mobility, and in short, the beginnings of late capitalism.

In architecture, the reaction against Modernism's machine aesthetic and the International style equally reflected a wider reaction against a universalising and totalising 'space'. Among the architectural avant-garde, this translated into a longing for architecture to assert a more prominent and transformative role in a social sense, and subsequently, the latent potentialities of technology were taken up in the service of resurrecting and rethinking the architectural discipline. Thus, technology was once again enrolled into an ideological project and became a vehicle to critique the conservatism of architecture, and to rescue the modern project and save it from "ignominy" (Sadler 2005, p.5).

Still, for the individuals and groups of the post-War period, such as Yona Friedman, Hans Hollein, and Cedric Price, Archigram, Archizoom, Coop Himmelblau, and Superstudio, new computing and communications technologies were taken up as part of their radical visions to reimagine cities, housing, and the very discipline of architecture and urban design itself. Particularly, key figures such as Banham, Friedman, Price, as well as Chistopher Alexander, Nicholas Negroponte and John Frazer, advanced the idea that computing technologies represented a way for architecture and design to extend beyond a 'technological aesthetic'. While the ways new computing, and electronic communications technologies would be explored by these leading figures differed greatly, each articulated the relevance of thinking computing technologies for architecture and urbanism.

4.3 Disciplinary limits: the technologies of space and the spaces of technology

In recent years, a number of scholars have drawn links between current thinking on contemporary ICTs and the radical architectural visions of the post-War period, including Martijn de Waal (2014), Mark Shepard (2011), Rowan Wilken (2007, 2011) and Scott McQuire (2008b). Many of these accounts foreground the speculative projects and polemic of the British group Archigram in particular. While Archigram's extensive body of work significantly influenced architecture and urbanism's thinking around emerging technologies, other figures such as architect Cedric Price more purposefully engaged with their *application* in and for the built environment. More specifically, Price adopted a system-orientated approach that utilised new computing technologies to advance the idea of adaptive and responsive environments enabled through user-participation and machine learning.

As one of the very few architects to have integrated ICTs into architectural proposals in a technically proficient way, Price's cybernetic approach, and moreover, the reasons that many of his project's failed to materialise, are considered significant to this research in several key ways. Chiefly, this concerns how computer-environment relationships were explored by Price, and to a lesser extent other figures and groups with which he was connected at this time. Price's attention to nascent ICTs and his ways of envisioning their potential for the built environment demonstrates thinking that pre-dates contemporary computer science theory, and namely, the ubiquitous computing (ubicomp) paradigm.

Advanced by computer scientist Mark Weiser of the Xerox Palo Alto Research Centre (PARC) in the 1990s, the ubicomp paradigm underpins much of the current discourse that advances the notion that ICTs more generally, and mobile digital technologies more specifically, have fundamentally transformed the built environment. The core premise of ubicomp thinking, namely the distribution of computational processes and performativities into the built environment and the activities of everyday life, is reminiscent of the intentions of earlier architectural schemes produced during the 1960s and early 1970s. There are of course marked differences, namely, the architectural projects that explored distributed computing concepts were doing-so at a time when ICTs had only recently emerged from military contexts into the consumer milieu.

For the architectural projects of the 1960s and 1970s the sheer newness of ICTs signalled an unexplored realm of opportunity, and thereby the architectural and design schemes that integrated them were more readily associated with avant-garde or radical thinking. Moreover, while Price's projects more generally reflected a highly detailed technical resolution and pragmatic approach, both the cost, complexity and inchoate nature of ICTs proved significant barriers to their realisation. Whereas Price had pragmatically explored the application of computing technologies, Archigram exploited their newness-as-novelty and shock-value. While provocative, Archigram's technologically explicit sensorial bombardments in print were taken to be supercilious by many, leading Martin Pawley (1976-1977) to declare that architecture had *retreated* from (seriously) thinking about the roles of technology for and within the built environment.

The initial architectural interest in the potential of emerging ICTs in the 1960s and 1970s is well documented in a number of significant European-based publications including *Architectural Design* (AD) and *L'Architecture d'aujourdhui,* the *New Statesmen, the Archigram* magazine (1961-1974), and Peter Cook's (1970) publication *Experimental Architecture.* Yet, by the late 1970s the technological shock-value had been exhausted, and the discipline appeared to have put computing back 'in-its-place' where it assumed the far less radical position of optimising extant disciplinary practices. Pawley argued that Archigram's effortless translation of technology into Architecture had made it particularly unbelievable, subsequently undermining the credibility of the discipline and the technologies themselves (1976, p.427). More recently, Kazys Varnelis has suggested that rather than innovative, Archigram's "pro-technology, pro-machine, pro-mass consumption, pro-obsolescence, anti-theory" stances were merely the ideological by-product of the Fordist recovery in post-War Britain (2006).[7]

Technology-led ideas, systems thinking, cybernetics, and pseudo-scientific approaches generally attracted various shades of negative criticism. The origins of cybernetics research were not so easily forgotten and notions of militarisation and oppression—considered antithetical to a societal ethos of decentralisation, choice, and empowerment—continued to plague its application. For architecture, confidence in

[7] Kazy Varnelis (2006) https://mailman.thing.net/pipermail/idc/2006-September/001897.html Last viewed 27 January 2017.

computing-environment and information-driven strategies waned as several of Price's projects, as well as city-wide initiatives such as Project Cybersyn in Chile (1972 -1973), proved problematic to implement technically, economically, and socio-organisationally (Morozov 2014). Equally, information-based approaches were rejected as aggressively "scientistic" (Baird 2002). Regarding Price's Potteries Thinkbelt project, George Baird (2002) argued it was too technical and had gone too far in the liberatory direction, while Jean Baudrillard saw such projects as just too experimental.

What both the aforementioned, but also more recent criticism directed at the various built environment disciplines' engagements with ICTs reflects is an assumed divide between humans and technology, and natural and artificial processes. This sets up the conditions to view ICTs from a substitutional perspective, where, for example, it is assumed that roles, such as critical design thinking, will be wholly abdicated to the computer.[8] This is epitomised by Peter Eisenman's very recent comments on architecture and technology where he argues that "[t]echnology is a cruel tool, because what it does is defer the possibility of…being creative. [you] can take an algorithm, produce 50 alternatives to the same problem…It takes away from you the possibility of value judgment" (quoted in Kellner 2016). Putting aside whether the computer can actually 'think' for us, comments such as these point to expectations around the 'proper' roles of computing technologies. Chiefly, this frames ICTs as an incursion on creative practice.

The substitution-ist perspective is easily problematized by pointing out that "the technological is not so easily distinguished from the 'human'" (Menser and Aronowitz 1996, p.9). To criticise cybernetics or parametric approaches as a thoroughly technological way of thinking, or as too scientistic, overlooks the various ways their underlying frameworks are constructed through human intentionality. Computational approaches, whether cybernetic or parametric, rely at some point on humans ascribing values to human activities. From a cybernetic perspective, and with respect to notions of context-awareness, what the system can learn is wholly contingent on human action and on observable real-time human behaviour. Paradoxically, the very advantage of

[8] Peter Zellner describes architecture's contemporary 'misuse and abuse' of technology with respect to its obsession with the 'the screen' and digital architectural practice. Here he argues that "the cult of the digital must be confronted and interrogated ruthlessly" (2016). http://archpaper.com/2016/09/architectural-education-broken-fix/ accessed September 2016

cybernetics is precisely in the way their epistemologies are *not* grounded in the dichotomy of human and non-human, and how such thinking seeks to map out the complex and interconnected relationships that exist between humans, animals, vegetation and technologies (Khan 2013, p.125).

Still, pointing to the human agency of technological systems also exposes the fallacy of earlier architectural explorations that positioned emerging ICTs in libertarian frameworks and as opportunities to realise the "do-it-yourself city" (Montès and Tschumi 1970) and people's choice mandate. Computing and communications technologies were seen as vehicles to enable social emancipation, and to provoke and challenge institutional and disciplinary ideologies. This imagined computational systems as facilitating participatory practices, wider and more equitable access to information, and subsequently a system of decentralised control. Yet, as with more recent claims that advance the democratising force and participatory possibilities of mobile digital technologies, do these technologies ultimately represent the substitution of one mechanism of power and control for another?

The relationship between technology and democratic potentiality has historically been a common discursive theme. How technologies stand to impact personal freedoms and democratic participation is, for example, a question that is divergently addressed in both Mumford and Banham's critical insights. While Mumford asserted that contemporary society had become increasingly enslaved through its own complex inventiveness, Banham (1960) more optimistically reflected that mass production ensured technologies were no longer only available to the elite, but rather a larger proportion of society. Given this, he argued that the "barrier of incomprehension that [had] stood between thinking men and their mechanised environment…" would crumble (1960, p.11). From another perspective, McLuhan (2003) described the impact of the technology of electronic mass media (radio and television) as a democratising force that created a 'global village' with widespread access to information. Particularly, McLuhan argued that the electronic technologies of radio and television restored 'equal' access to public information that the older technology of print media had disallowed (2003, pp.65-79).

In one sense, the newness of computing and communications technologies in the 1960s and 1970s strongly contributed to their perception as neutral instruments operating

outside of authoritarian frameworks. On the other hand, and from Mumford's (1964) perspective, when situated within a much longer arc of technological progression computing and communications technologies could be viewed as a more sophisticated and invidious regime of control and suppression. It is along these lines that Khan (2013) critiques Price's cybernetic approaches, as naively assuming that providing the means for people to design their own environments will equate to them 'doing the right thing'. Khan argues that given the tendency for corporations, people, and populist sentiment to be regularly manipulated to suppress dissent, that Price's anticipatory architecture is one that could too easily become compromised. This implies technological integration into environments merely facilitates a guise of choice, and an illusory handing-over of the levers of decision-making and control to individuals. Khan's critique of Price appears to undermine the very idea of a 'participatory' architecture enabled through computational means, as such approaches "surrender the power of architecture to resist quixotic change in favour of a populist stance to serve people" (2013, p.124). In sum, he argues that Price's humanist agenda was obscured by the "technophilia of his architecture" (2013, p.124). Problematically, Khan's position assumes architecture's 'power'—its communicative and symbolic significance and relevance—to be unchanging in the face of contemporary digital culture, and he makes no allowances for the notion that such participatory, or hybridised, conditions might already exist.

It is worth remembering that many of the avant-garde groups, and the so-called 'rogue' individuals such as Price, were re-imagining the relationships between architecture and emerging technologies during a period of intense socio-political unrest and global economic uncertainty. Various groups came together to address their dissatisfaction with the architectural discipline's perceived failure to address pressing social concerns. In Italy, speculative projects such as Continuous Movement by Superstudio, No Stop City by Archizoom, the Mediatory City by Gruppo Strum, and La Città Lineare by Ziggurat functioned as derisive critiques of the urban environment and the inadequate solutions of the modernists. It is in this context that emerging technologies were cast as provocative ways to agitate for changes in institutional, state, and disciplinary contexts, and seen as a means of progress and liberation. Peter Cook reflected that projects purposefully adopted computing and communications technologies to transcend an extant architecture of "…decrepit technologies propped–up by an elitist aesthetic language" (1970, p.67). Price saw technologies as a way to overcome architecture's

dogmatism and its chief barrier to addressing pressing social problems, the constraint of time. (Price 2003, p.136).

Yet, for Price and others, such as Professor John Frazer, who pursued similar ideas during the 1970s and into the 1980s, it was not architecture per se, nor even the excessive cost of machine and computing hardware and software, and processing capacity, but rather the social and political will that would also prove to be discouragingly slow. As Frazer (2005) commented, "the technology moved fast—in many ways faster than expected. The social and political and economic systems did not" (p.36). While computer-environment concepts stalled in many ways, they moved forward in others. Following the 1960s and 1970s and the era that had bought prominence to the depleted state of the environment—natural systems and resources—the promise of environmental efficiency became a more acceptable reason to adopt new technologies. After all, applying technologies in the context of building performance could be shown to offer cost savings. In this way "[e]nergy management systems were introduced as well as microprocessors but, for the most part, the architecture world had yet to embrace the promises of such technologies from an interactive standpoint" (Fox and Kemp 2009, p.17).

Meanwhile, at the urban scale, the developing technologies of computation presented opportunities to challenge the conception of the city more generally, to tackle the new challenges of growing populations, and to rethink disciplinary approaches.[9] By the 1950s, the impacts of the various technologies and networked infrastructures, such as electrification, mass transit systems such as railways, and roadways for motor vehicles, to name a few, had radically altered Western cities economically, socially and morphologically. Cities had dramatically increased in size, extent (suburbanisation), and complexity. Emerging computation methods that had originally been developed in military contexts were seen as viable methods for urban planning and subsequently translated to the analysis of everyday city operations and structures. Cybernetic logic and systems theory analysis methods seemingly offered great potential for urban renewal projects (Picon 2010, p. 4). Computer modelling of transportation networks and

[9] For key texts on architectural computing see: Serge Chermayeff & Christopher Alexander's *Community and Privacy* (1963), Yona Friedman *Towards a scientific architecture* (1975), Nicholas Negroponte *The architecture machine* (1970); *Soft architecture machines* (1975) and Peter Cook *Experimental architecture* (1970).

land-use planning gained recognition and implementation by end of the 1950s. Notably, in his publication *Urban Dynamics* (1960), computer scientist Jay Forrester undertook a city systems analysis using a state-of-the-art IBM 360/67 to test urban policy decisions, modelling urban problems such as housing and unemployment.

In response to the over determination of Modernist planning approaches, but also New Brutalism's 'non-scientific' approach, Christopher Alexander emerged as a key figure in the application of external methods to urban problems, and in particular systems analysis and anthropology. The 1963 publication by Serge Chermayeff and Alexander *Community and Privacy* became an early contribution to the exploration of computing possibilities in areas of mass housing. Significantly, this argued that the electronic age had produced conditions that necessitated *more* provision of private space. To address this, they set out to explore new modes of dwelling with the aid of computer software (p.160). In contrast to how Price had integrated computing *within* projects as integral parts within an overall system, Chermayeff and Alexander saw the role of computing in architecture as a tool to be utilised by the designer (Wilken 2011, p.90). However, ultimately their design methodology could not cope with the complexity of the city, and the approach regressed into an "extreme form of rationalism, positivism and [technological] determinism", that Tahl Kaminer argues implied an "attempt to standardize life rather than express or enhance it" (2011, p.30).

4.4 A 'digital-turn': changes in public consciousness and design practice

While earlier urban and architectural computational explorations faced significant challenges, they nonetheless established an alternate positioning of technology in relation to the *future* of design practice and visions for the city. Scholars and architects such as Nicholas Negroponte[10] (MIT Urban Systems laboratory), Kas Oosterhuis (Delft), and John Frazer (Architectural Association) would continue to explore integral and generative roles for computing in the design process, but, according to Mario Carpo (2013), it wasn't until 1992[11] that a significant shift in the attitudes towards technology occurred in mainstream architectural practice and education. Carpo attributes the so-

[10] c.f Nicholas Negronte (1970) *The architecture machine: Toward a more human environment*
[11] While a much earlier version of the World Wide Web was in operation for a limited number of technical experts from as early as 1973, the year 1992 also marked the 'public' release of the World Wide Web (Allen 2012).

called ‘digital turn’ in architecture to key technical developments. An exponential increase in micro-processing capacity, coupled with the falling cost of hardware and software and consequently its rising affordability, has meant computing has become an integral part of architectural practice. Thus, Carpo’s digital turn describes the moment when digital technologies entered mainstream architectural practice as vehicles and tools of representation and more formalised design methods (2013, p.9).

This ‘digital turn’ defines the normalisation of particular digital practices in architectural design and to the commonplace use of computers in the analysis, representation, and production of architectural and urban space (visualisations/renders). Yet, it also represents an extension of the instrumental view of technology in architecture, as tools for form-generation, spatial organisation, aesthetics, and performance. The promises of interactive and dynamic computational design thinking, as imagined by key figures such as Price and Oosterhuis, is often still perceived as innovative, specialist, or an academic pursuit. While more recently numerous publications have advanced performative approaches to thinking about architecture,[12] philosophically directed questions concerning the role technologies play in everyday life, and how this impacts the built environment, remain less attended to.

That digital technologies, and particularly mobile digital technologies, are playing an increasingly dominant role in shaping the experience, comprehension, and representations of urban space, are matters that a select few scholars within the built environment traditions address. A leading advocate for introducing interaction design thinking into architecture, Malcolm McCullough (2013) argues we are in an era of significant change, and that “amid that transformation the role of technology [shifted] away from a means to overcome the world towards a means to understand it” (p.13). Yet, while this may be true, technologies not only provide ways to understand social

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[12] Branko Kolarevic and Ali Malkawi’s (2005) *Performative architecture: Beyond instrumentality*, Michelle Addington and Daniel Schodek’s (2004) *Smart materials and technologies in architecture: For the architecture and design professions*, Michael Hensel and Achim Menges’ *Morphoecologies*, and Neil Spiller’s (2008) *Digital Architecture Now*, Michael Fox’s *Interactive architecture* (2009), Philip Beesley and Omar Khan’s (2009) *Responsive architecture / Performing instruments*, Michael Fox’s (2009) *Interactive architecture and Interactive architecture: Adaptive* World (2016, and Carlo Ratti with Matthew Claudel’s (2015) *Open source architecture*.

and cultural systems, but rather they act within them in increasingly significant ways. To speak of a 'digital culture' is to acknowledge how digital-technology-related-phenomena impact ways of living and seeing, understanding and representing the world (Brewer and Dourish 2008; Picon 2010). Paradoxically, digital technologies equally offer new and significant opportunities to explore and understand these new cultural conditions.

4.5 Digital culture: from Internet Studies to mobile media

The concept of a 'digital culture', while less discussed in the built environment traditions, has been long explored in the cultural and social sciences. Since the 1990s the definition of digital culture has shifted and expanded from a narrower focus of internet engagement (Internet Studies) to encompass the multiple and variegated practices associated with a pervasive ecology of digital technologies and practices. Broadly speaking, adopting a cultural position towards any form of technology helps to circumvent neutral or technological determinist framings and extends the discussion toward broader questions about how technologies impact everyday lives in terms of needs, wants, and symbolic value attachments. Rethinking technology as a practice rather than a product allows a broader set of relationships between people, place, and technologies to be addressed. Ito (2012) observes that a cultural approach to digital technology accepts "…that technology does not stand apart as an external force that impacts society and culture. Rather, technologies are embodiments of social and cultural structures…" (p.4).

The motivation to frame digital technologies in cultural terms, as a mode of being, a way of life, a practice, or a kind of thinking, in itself points to their significance in relation to contemporary understandings of people and their everyday practices. The popularly accepted ubiquity or pervasiveness of digital technologies in everyday life, and the ways that mobile and embedded technologies are argued to extend sensing and sensorial functions of both the human body and the environment, suggest that they are the prevailing technology of the time. Yet, Madanipour (2011) has downplayed the tendency to attribute greater significance to digital technologies in the transformation of urban space, and is quick to point out how modern technologies have long been located within historicized accounts of significant cultural, social, and economic change. The

cultural significance of the car, and the practices of driving for example have been widely discussed by a number of scholars, and particularly in the context of mobility theory (Sheller and Urry 2003; Merriman 2004, Cresswell 2006).

Equally, Madanipour argues that arguments for the significance of digital technologies in the reconfiguration of space and time, have been made in relation to clocks, engines, and computers, as new ways to measure time, control space, and manage information (2011, p.100). Furthermore, these technologies have carried significant symbolic weight in characterising an era, and in the ways they have influenced certain ways of conceptualising space, and thus shaping cities. Still, a number of scholars have pointed to how the impact of digital technologies reflects significant qualitative differences over previous technologies, such as for example the car. Furthermore, digital technologies are often implicated in the decline of 'car-culture' by making possible new ways of being mobile, new forms of 'presence', and shifts in value attachments, from objectively-based to information-based. More broadly, Lev Manovich has theorised this shift as the aesthetisation of information and experience (2013, p.313).

4.6 A critical philosophy of technology

Mobile digital technologies are characteristically different from previous technologies. For Tina Sikka (2011) they are "engineered to transform more fundamentally the sociocultural, environment, and biological landscape of our lives" (p.94). According to Sikka, the ubiquity of digital technologies in our everyday lives represents the arrival of a profoundly "invasiveness and totalizing logic" (2011, p.94). Given this, philosophical perspectives appear ever more essential to understanding new technological systems. Sikka cites three key thinkers who offer conceptual ways to advance a critical philosophy of technology, as Martin Heidegger (1977), Jürgen Habermas (1991), and Andrew Feenburg (1971),

From a philosophical perspective, and more specifically a phenomenological position, Martin Heidegger's (1962) earlier perspective describes technology as an ontological practice. Heidegger points to the futility of conceptualising technology only from an instrumental and anthropological perspective, arguing that this obscures the way to bring man into "the *right* relationship to technology" (1977, p.5 my emphasis). To explore this further, he questions the nature of the instrumental itself, and to what means

and ends technologies belong. Significantly, while Heidegger acknowledges how technologies usher in new modes of being and seeing, at the same time he questions their underlying drive and logic.

Reflecting on Heidegger, architectural theorist Jonathon Hale comments that "we live in the space opened up and revealed by technology" (2012, p.513). In this way technology is positioned as fundamental to our survival and growth in the world. Technology, considered in the broadest sense, enables the transformation of the natural environment so that we might meaningfully and wholly *be* in it. Hale describes this extension into the world through technology as the creation of a "third space", and moreover a "liminal realm where it is becoming more and more difficult to say…what belongs to the self and what belongs to the environment" (2012, p.514). This perspective draws on the work of philosopher Maurice Merleau-Ponty (2002) and the concepts 'chiasm' and the 'flesh of the world' that describe how the body is intertwined with its perceptual field. In this sense the body is regarded as the first medium, and moreover 'technology', through which we experience the world. This draws into focus the question of where the body—or the self, or the subject—might 'end', and conversely, where technology begins. This approach to thinking technology problematizes the suggestion that there exists a "fixed and stable boundary between the self and the environment" (Hale 2012 p.514). If the boundary between the self and technology can be conceptualised as a continuum, by extension, so too can the boundary between technology and space.

Engaging philosophical concepts offers a way to critique prominent themes of technological promise that are present in contemporary popular media on digital communications technologies and academic discourse alike. A critical philosophy of technology approach lends emphasis less to the specificities of any particular technology and more to the modes of thinking and being that they might affect (Sikka 2011). Yet, the adoption of philosophical concepts, including notably phenomenological theories of embodiment and practice-centred thinking, are similarly adopted in technology-allied fields such as HCI in ways that advance the agency of technologies and seek to explain the significance of human-computer relationships. The phenomenological angle humanises technology in ways that make claims for its many potential applications in everyday life more palatable.

4.7 Technological embodiment: liminal spaces of interaction

The examination of twentieth century philosophical theories linking technology to the transformed meaning of a space reinforces their limited application to the theorisation of the transformative power of mobile technology practices. This relates to the ways these theories and selected concepts are interpreted and applied in different ways across disciplinary contexts. The phenomenological inquiry of embodiment relations has been brought to bear on a number of different scales or sensory ranges and perspectives, from the perceiving body, to the perception of a building or place, to the more generalised notions of the ways society and the city perceive and are perceived. While in the social and cultural sciences, the concept of embodiment relations has been applied to explore and critique relationships between technology, self, and the world, in architectural and urban discourse, the dominance of phenomenological philosophical theories and their tendency to delimit and equate meaning (and therefore an experience of self-transformation) with a singular, enduring, 'immobile' place character tends to advance certain views on the ontological agency and thus significance of architecture.

Similarly, in HCI philosophical theories pertaining to embodiment relations find application in arguments that advocate for the transformative logic of pervasive or ubiquitous computing in ways that underscore particular disciplinary perspectives and approaches and their validation. Ubiquitous computing (ubicomp) is a foundational concept for the HCI field, as it advances the wide-scale application of computing to assist everyday practices. The seminal articles published on the topic in the late 1980s and 1990s catalysed a new generation of thinking technologies for people and the built environment in computer science as well as affiliated fields such HCI, interaction design, and more recently, urban informatics. While ubicomp thinking continues to be significant well into the twenty-first century, several scholars have refreshed the polemic through phenomenological frameworks of thinking (Dourish 2001, 2004, 2006; Dourish and Bell 2007, 2011; Farman 2012a; McCullough 2013).

Broadly defined, the ubicomp paradigm "…proposes a digital future in which computation is embedded into the fabric of the world around us" (Dourish 2004, p. 19). Put another way, ubicomp envisions a variety of ways to extend and distribute computing into physical space, and to weave "networked information technology into

the places and activities of daily life" (Agre 2001, p.178). Since Weiser's ubicomp manifesto, many researchers in HCI and allied fields have pursued the initial objective of finding opportunities to link computational and physical activities together in ways that enable the computer to 'withdraw' into the activity, such that the distinction between the interface and the action becomes indistinguishable. The pursuit of "calm technology" (Weiser and Seely Brown 1996), and more recently, "ambient interfaces" (McCullough 2013) recall key philosophical inquiries around the nature of sensory perception and awareness through the body.

The means of extending and augmenting the body's sensory system through various forms of technology, otherwise understood as the pursuit of technological embodiment, are ideas previously addressed by Merleau-Ponty (2002) and Heidegger (1962) alike. If the body is the first technology of mediation then objects (technologies) such as telescopes, spectacles, hearing aids, and canes that seek to extend, amplify, and rectify the sensorial systems of the body, become secondary or re-mediating technologies. These technologies constitute "a means through which the environment is perceived and acted on" (Brey 2000, p.1).

For Heidegger, a key example of embodiment is the 'skilful' use of a hammer that enables the tool to 'disappear' or retreat from the user's consciousness or awareness. Similarly, Merleau-Ponty (2002) describes the augmentation of sensory awareness that is achieved through technologies such as spectacles to 'correct' vision, and the blind person's cane to assist navigation. As Hale suggests, these examples provide a strong argument to see technology "less as a barrier between the body and the world and more as a means to bring the world even closer" (2012, p.516). Brey (2000) notes that embodiment relations (Ihde 1979, 1990) raise significant epistemological questions at the scale of the individual body and the social body. For the individual, secondary or rectified perception necessarily differs from the primary perception of the body. At the larger-scale of society, embodied artefacts such as the microscope have led to profoundly different ways of understanding the world. Given the technologically mediated nature of everyday life, the concept of embodiment is particularly relevant to questioning the extent to which mobile digital technology practices participate in, constrain and facilitate the actions of perception (Brey 2000).

A primary goal of the ubiquitous computing paradigm has been to change the very perception of computing through enabling different ways by which it might be interacted with in different settings. Dourish (2001) argues that the concept of embodiment is key to realising this objective to, and furthermore that this entails making the interactions with computing "seem more like…everyday action" (p.100). In this context, embodiment is understood as the direct, rather than abstract, experience of physical reality, yet it does not rest on physical interactions alone. Embodiment takes into account both immediate corporeal experience (the sensing body), as well as the more ephemeral social phenomena such as conversations and interactions where information can be communicated or 'given' in non-verbal ways intentionally, and often unintentionally (Goffman 1963).

More broadly, phenomenological thinking holds that, in order to understand people's behaviours, it is necessary to understand the meaning they attribute to the activities in which they engage (Husserl 1936; Heidegger 1962; Merleau-Ponty 2002; Schutz 1964). Phenomenological methods then are approaches for exploring human experience, perception, and sense-making. This makes phenomenology a particularly useful model for conceptualising human-computer-interaction. Dourish writes that "[p]henomenology aims to uncover the relationships between the objects of consciousness—the objects of intentionality…and our mental experiences of those objects, our consciousness of them" (2001, p.105). Put another way, and in liminal terms, phenomenology is chiefly concerned with revealing the underlying meanings of actions and behaviour, with its chief site of exploration located in the space *between* experience and action—arguably, a liminal realm.

Within phenomenological thinking Husserl's (1936) concept of the "life-world" or *lebenswelt,* gives significance to the intersubjective, mundane, everyday world of background understandings, and the role that unconscious and deep-seeded understandings play in our dealings with everyday reality. Understandably, the concept of the lifeworld has also found renewed application in explicating the conditions of contemporary digital culture. In one way, various scholars hold that the ubiquity, or pervasiveness of digital technologies in relation to everyday practices suggests that the contemporary lifeworld has been reconstituted. Framing digital technology practices as informing the world of natural attitudes and of everyday experiences normalises such

practices and positions them as significant to the lifeworld's (re)formation, rather than being antithetical to it. In particular, geographer Nigel Thrift (2011, 2014) adopts the lifeworld as a way to theorise wide-ranging ontological changes in Euro-American (Western) cultures. He argues that the lifeworld is in the process of being reconstituted through a sea of digital data, and through "new practices of organising, analysing, displaying, storing, and communicating information" (Thrift 2011, p.6).

Elsewhere, the significance of appreciating 'background understandings' is implicit in Lev Manovich's cultural analytical approach to the media produced through digital technologies, otherwise known as new and locative-media. Here Manovich describes a method of new media study as a form of "wide data analysis" that enables a questioning of the "common sense view of things, where certain dimensions are taken for granted" (2015 p.13). As such, Manovich echoes Turner's description of the reflective opportunities of the liminal phase, and particularly, its primary role in deconstructing—if only temporarily—the constructions of common sense (1977, p.68).

From a slightly different perspective Heidegger's position as presented in his seminal work *Being and Time* (1962) advances the idea that thinking and being are not distinct phenomena. Rejecting the Cartesian dualism established by Descartes, this approach places greater emphasis on thinking as derived from being, or, acting in the world. From this perspective the phenomenological focus shifts from epistemic to ontological; from the question of the origins and constructions of knowledge to the question of being. Heidegger's key interest is in the ways the world reveals itself through our encounters with it (Dourish 2001, p.107).

From an HCI perspective, Heidegger's philosophical position is significant in that it centralises action and interaction with things in the world as a way towards understanding the world. Put another way, and drawing from Heidegger, Dourish argues that, "[t]he nature of being—how we exist in the world—shapes the way that we understand the world" (2001, p.107). Extending this logic, the computing interface, as both a thing in the world and a mediator of experience and action, is assigned significant epistemological influence. Furthermore, if according to Heidegger, we understand the world through the ways we act and interact in it, by extension the nature

of the computing interface stands to influence our comprehension and overall experience of meaning.

The appeal of phenomenology as that which privileges the relationship between action-in-the-world and meaning, over abstract reasoning for advancing ubicomp thinking is logical. Yet, equally phenomenology posits that meanings pre-exist in the world, and in this sense interactions do not produce new meanings per se, but rather are constitutive of the processes that reveal them. From this standpoint Heidegger's reflection on the role of technology in the mediation of (pre-existing) meaning lends far less weight to the ubicomp cause. In "The Question Concerning Technology" (1977) Heidegger sees modern technology as a barrier to the kind of revealing that practical action-in-the-world otherwise offers. Here, Heidegger develops a critical account of modern technology's capacity to obscure our access to the 'truth', and in ways that echo Marxist thinking, for its alienating effects.

Despite phenomenology's focus on how action, and interaction reveal the meanings of the world, a chief criticism has long been the notion that meanings are pre-given, stable and fixed. Subsequently, post-phenomenological thinking has addressed the problematic of fixed and stable meanings by recognising the role of pragmatism and praxis, to further extend the foundational concepts of embodiment and bodily perception through dynamic perspectives (Ihde 2009, p.23). Post-phenomenological thinking is implicitly and explicitly evident in a range of discourse on the wider, societal impacts of contemporary ICTs more generally. And as Wellner (2016) reflects, given post-phenomenology is a genealogy-orientated theory that offers a theoretical way to contextualise research findings 'in-the-world', it constitutes an important analytical arsenal for examining relations between mobile technology practices and the built environment.

More generally, Nigel Thrift's (2011) theorisation of movement-space can be regarded as a post-phenomenological query of bodily experience and meaning-making. Thrift points to the key impacts of digital information in epistemic and ontological terms, reasoning that the new information age represents a transformation in the production of space through the changes to the way we *interact* with information. He argues that "…new practices of organising, analysing, displaying, storing, and communicating

information" correlate with a larger shift in the way we sense, and thus, experience and act and consequently, understand our place in the world (2010, p.6). Particularly, he argues that new ways of being and sensing the world *through* digital technologies "sacrifice[] perceptual certainty for…alternative rigours…[and] a generative phenomentality" (p.8). Returning to the scale of human experience he writes that this has produced an overall redefinition of the body, "where new forms of the body and mindfulness are being produced via technologies" to amplify and extend the body (2011).

More specifically, mobile media theorist Jason Farman (2012a) applies a phenomenological approach to thinking on contemporary mobile technology practices and particularly on the production and engagement with locative-media. Farman reasons that as mobile technology practices entail simultaneously locating the body in both a digital and actual space that this transforms embodied space. In other words, this understands sensory experience and our ways of being-in-the-world to be comprised of both (immaterial) digital information and interactions as well as (material) environmental information and interactions. He further reasons that if embodied space is transformed, then so too are cultural objects and meanings (2012a, p.16). This challenges the premise of embodiment as the immanent presence and experience of the physical environment as is enabled through the first mediating technology, the body. In this interpretation embodiment, or the spaces of the body, can be enacted or produced through various means of communication. This echoes Dourish who sees embodiment as "a form of participative status" (Dourish 2001, p. 18, 100).

Mobile technology practices can operate to extend the human sensory system in ways that multiply contexts of embodiment. In so doing, Farman contends that this exposes the false dichotomy of the real/virtual (2012a p.16). He places the virtual in the service of the real when he argues that "the virtual is not the opposite of the real; instead it is a component of experiencing the real" (2012a, p.22). This confronts the assumption that the sensations provoked by and through mobile technology practices and mobile media are any more or less authentic than the stimuli of the physical environmental.

Neil Leach (2002b) suggests that architectural culture has been adversely swayed by interpreting Heidegger's essay "The Question Concerning Technology" as overtly

critical of technology. Given this, Leach dismisses Heidegger's reflections on technology as 'unfashionable' and reductive. Yet, in his haste to advocate for a better understanding of digital technologies he overlooks Heidegger's relevant critique of scientific rationality. Rather than forgetting Heidegger, it is perhaps worth revisiting this essay as a cautionary tale of technological totalisation. Written in the latter half of his career, the essay "The Question Concerning Technology" represents a shift away from the romantic notion of hand tools as conveyed in his much earlier publication *Being and Time*. In "The Question Concerning Technology" Heidegger argues that the underlying logic of science and technology is not to liberate humankind, but rather to continue the long-standing project of domination. It is however worth recalling that Heidegger's views concerned primarily industrial technologies, including large-scale, machinic, systemic, and complex technologies whose chief purpose was the conversion of natural resources into energy (Heidegger 1977; Ihde 1993). Yet, more generally, Heidegger argues that the essence of technology is not 'technological', but rather that the technological gaze establishes nature as a resource to be used up. In this way he surmises that all modern technology is driven to enrol all things into a system of productive forces. Extending this logic to contemporary technologies, if mobile digital technologies are regarded as primarily a technology of the mind, it is productive to consider, as opposed to affording user's more control in their day-to-day lives, in what ways are they also being 'put to work' through mobile technology practices?

This chapter has set out how the various ways of conceptually framing technology have implications for understanding the impacts of technologies cognitively, socially, spatially, conceptually and ontologically. Mitchell's extensive writing on existing and future relationships between emerging digital technologies and the urban and built environment serves as an early—and significant—recognition of the force of a burgeoning digital culture, and moreover a philological approach to its examination. This approach attends to technologies in relation to social organisational change, often situating technology as a central force, but it does not attend to the meaning of technology in relation to everyday life. When questions are asked about what new technologies might mean for urban culture and how it impacts our identities and communal life, then the discussion becomes 'philosophical' (de Waal 2011b, p.190).

A limited range of scholars from within the built environment traditions have engaged with questions of technology in philosophical ways, with the bulk of technological inquiry adopting an instrumental perspective that casts technologies as tools within design practice, or construction outcomes. This relegates technologies to the role of "apparatus…physical devices of technical performance" and "technique" (Winner 1977, p.11-12) However, in various ways technologies can also play an important role in human experience. Ways of 'thinking technologies' are thereby intimately connected with ways of understanding space. Farman's chief contention that "mobile computing has *transformed* embodied space in the digital age" relies on bringing philosophical concepts to bear on the interpretation of the relationships between people, technologies, and the built environment (2012a, p. 19). Equally however, philosophical thinking can also equip us to critically challenge reasoning that conflates potentiality with actuality, and tends towards technoromanticism (Coyne 1999).

Chapter 5: Mobile technology practices

"…the mobile phone is subtly insinuating itself into the capillaries of every-day interchange, alternating our forms of life, and bringing about new possibilities in its wake" (Gergen 2010, p.14).

This chapter begins by outlining and comparing a number of competing technourban imaginaries that emerged in the 1990s from within the built environment traditions and computer sciences that paralleled the growing user-base of networked computing. This includes from an architectural and urban perspective the work of Carr et al., Martin Pawley, William Mitchell, and Paul Virilio, and in computer science Mark Weiser's much revered ubicomp vision. The examination of these selected discourses reveals how the key concepts of technology and public space have been invoked in claims to urban transformation in often ideological, anticipatory, and aspirational ways, as well as to serve ulterior motives for urban development or technological opportunism, and more broadly to serve disciplinary interests to (from and urban and architectural perspective) fortify existing fields of knowledge, and in the social, cultural and computer sciences, to legitimate burgeoning new fields of research. Significantly, this chapter introduces and charts a critical scale shift in research foci in the social and cultural sciences from 'aspatial' internet studies to *mobile* information and communications (mICTs) studies and attention to their contexts of use, namely urban public space. The survey of largely empirically-driven mobile communications research in this chapter identifies three key discursive socio-spatial themes—encountering, negotiating, and appropriating—through which mobile technology practices are argued to have transformed urban public space. This discourse evokes notions of liminality in the ways that various mobile technology practices are described as affecting a reworking of long-standing and tacit understandings of socio-spatial interaction, attention, and behaviour in urban public space. Yet, given the notion of liminal transformation lies in processual transience to a final state of re-aggregation and the 'restoration' of social order, this suggests that the transformation of urban public space is potentially proximate rather than guaranteed.

5.1 Technology and space: the visible and the invisible

In a prominent publication advocating for the value of public spaces in Western cities, urbanists Carr et al. describe the similarities between the 'public life' as depicted in a contemporary photographic image of the Piazza San Marco in Venice, Italy, 1992, and similar views as depicted in a series of paintings by the eighteenth century Venetian artist Canaletto (c1730-1735) [Figure 1.0]. In drawing these comparisons, they contend that the public life of each period—separated by over two hundred and sixty years—appears to be "much the same" (1992, p.22-23). This prompts an obvious question: how

is it possible that public life—in the Piazza San Marco or any other location—could have remained much the same over the course of several centuries? [Figure 2.0] Accepting that a more detailed comparative study was not Carr et al.'s objective, this cursory visual observation of the Piazza San Marco is instead offered by the authors as an example of an enduring, and thus prototypical, example of urban public space.

Figure 1.0
Canaletto (Italy, b.1967, d.1768)
The Piazza San Marco, Venice 1742-1746
Oil on canvas, 67.5 x 119cm
Art Gallery of New South Wales
Gift of James Fairfax AC 1996
Photo: AGNSW 302.1996



Figure 2.0 The Piazza San Marco with ‘selfie’ takers in the foreground, Venice (2014)

What is primarily taken into account in this observation of the Piazza San Marco is what is visibly apparent in the photographic and painterly representations. Critically, these representations capture a static moment of time, rather than a series of moments through, or over time. This constitutes a visio-physical or materialist approach that affords primacy to the architecture, spatial layout, and the presence and organisation of people within the space. To adopt Edward Soja’s terminology, this is a predominantly “contextual view” of “organized space” (1980, p.210). Carr et al.’s comments regarding the public life in this example suggest that, when organised in a particular way, the physical characteristics of a space strongly influence the social environment, which connects physical conditions with the constitution of public life, and views public space as a container for social action. Not unreasonably, this assigns a determining, and thus powerful, role to the physical characteristics of public space.

What can be seen and measured, and notably the quantity of people in a space, often equates to a sense of public life, and by extension, legitimises locations as ‘public’. In

other words, publicness is often taken to be the mere presence of people within a space.[1] This reflects William H. Whyte's (1980) definition of good public space that understands the notion of publicity as pertaining chiefly to presence and performance. This also aligns to Weintraub's 'classical' definition of public space as the representation of citizens gathered in a physically demarcated space in an apparently civil manner (Weintraub 1997). In this way, the notion of 'public space' stands for social processes.

In reasoning that the Piazza San Marco's physical, and thereby, social character has remained largely the same over time, further speculation of social, cultural, or political conditions is eschewed. Effectively the notion of space here is cleaved from time and event, rendering other critical indicators of change and transformation invisible. When represented as static and stable, the very concept of public space becomes conceptually unproblematic. Elizabeth Grosz (2001) notes that "architecture, geography, and urban planning have tended to neglect or ignore temporality or to reduce it to the measurable and calculable, that is, to space" (2001, p.xix). Left unaccounted for here are the potentially richer understandings of public space that might be made evident through less visually-centric, and more dynamic, approaches to its examination.

As Edward Soja states "[s]pace itself may be primordially given, but the organization, use, and meaning of space is a product of social translation, transformation and experience" (1980, p. 210). A more comprehensive understanding of public space thereby extends the definition of materiality beyond bricks and bodies, to consider of clothing, behaviours, expression, and language, but also, events, and interactions (Lofland 1973; 1998). The physicalist perspective of the Piazza San Marco in this case opts out of any further historical interrogation to uphold the golden-age legacy of traditional urban public space. Understandably, this example serves to counter the popular 'end of' proclamations of the post-modern era, by demonstrating that public space (in its classic definition) has *endured,* and remains relevant.

While notions of change and transformation may have been sidelined in their brief discussion of the Piazza San Marco, the authors take a different view when it comes to

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[1] This reflects William H. Whyte's definition of good public space that espouses the notion of publicity as performance (1980) as referred to by de Souza e Silva and Gordon (2012, p.98).

speculating on the future of public space in relation to emerging technologies. Maintaining the spatial perspective (Soja 2003), Carr et al. link the development of micro-computing and the concept of teleworking to restructured modes of production, and potential new geographies of the home and work place. They argue that "…although different forms of communication and mutual assistance [would] likely develop around the microcomputer, the local community may also come to serve new functions as homeworkers seek out contacts to *replace* the camaraderie of an office" (p.29, my emphasis). While teleworking was commonly viewed as offering the promise of changes to work and social practices, and thus spatial distribution, use, and meanings, for Carr et al. it signalled the possibility of the *renewed* significance of urban public space as a respite space for social-opportunity in contrast to the isolating confluence of a home/work place.

These views are introduced here as Carr et al's 1992 publication on public space continues to be a primary source for understanding public space for a host of scholars (see Memarovic et al. 2012). Furthermore, the Piazza San Marco example provides a lead-in to the key points this chapter will address. Firstly, this example recalls the nostalgic position as referred to in chapter 3: the ways notions of civic behaviour are often conflated with, or causally linked to, the physical-material and formal characteristics of public spaces. Secondly, it reflects an empirical understanding of space—a measurable Euclidean spatiality, or a physicalist view (Soja 1980), common to the built environment traditions that casts public space as a bounded geometry, and that which contains—in both senses of the term— the 'public'. This logic tends to position social-materiality as secondary to, or the product of, a spatio-physical materiality. Thirdly, Carr et al's position on human-technology-place relations more generally gestures towards the technological gaze as discussed in chapter 4, and to the ways that (knowingly and unknowingly) this connects to broader socio-political and economic agendas.

Positioning technology-driven solutions such as teleworking as the way to catalyse the renewed utility of urban public space reflects a determinist approach that finds continued practice in more recent scholarship around mobile technology practices. As such, this chapter proceeds with a brief discussion of the expectations and visions, or technourban imaginaries that formed around ICTs in the 1990s. This is followed by a

shift in focus towards scholarship concerning early mobile communications technologies and their relationships to urban public space. Building on the foundational knowledge established in chapter 3 and drawing on selected empirical and theoretical research studies on mobile communications from within the social and cultural sciences, chapter 5 identifies three key discursive themes that connect mobile communications technologies with the transformation of urban public space. Considered here are the ways urban public space is conceptually framed, and whether and how this contributes to reinforcing or refuting established dominant attitudes/positions. Furthermore, this asks what is at stake in the ways people, urban space, and mobile technologies, are brought into discursive relationship with one another? What claims are being made here, and on what (theoretical, conceptual or empirical) basis are they substantiated?

5.2 Great Expectations: technological visions

In the early 1990s the visions and expectations around emerging ICTs polarised popular and scholarly opinions. On the one hand, as Grosz (2001) describes, the 'technophiles' and 'cybernauts' viewed this technology as signalling the potential for "new spaces, new identities, and new relations, in short, new worlds, open and available, tailored to one's individual predilections and tastes … a world of unfettered choice" (p. 77). Far removed from the popular dystopic cyber-visions of social polarisation, individualisation and privatisation associated with the developments of the microcomputer and the internet, urban scholars such as Carr et al. saw the concept of teleworking as a pathway to draw people away from dilapidated city centres, and to *reconnect* them to smaller-scale local communities through public spaces. This view held that public spaces would find renewed significance as communal spaces for homebound teleworkers to meet and socialise. Such positions were characteristic of a wider 'anti-urban sentiment', that saw technologies opportunistically as a means to escape a beleaguered post-industrial metropolis (Graham and Marvin 1996).[2]

The telecommuting scenarios imagined in the 1980s and 1990s were depicted in literary and cinema contexts alike including films such as *The Net* (1995). Here the "cyberspace

[2]Stephen Graham and Simon Marvin (1996) discuss a long tradition of anti-urban sentiment as stretching back to Ebezener Howard's Garden City visions. Telecommunications were seen as a "tool for engineering the large, industrial city out of existence through radical decentralisation and the assumption that social transformation would stem from 'wired city' projects" (p.89).

imaginary" represented isolated teleworkers as plugged-in to the network via a home-based desktop personal computer (PC) (Jordan 1999). These representations echo Virilio's (2003) apprehension about electronic technologies and teleworking scenarios that he envisioned would produce the 'terminal citizen'; an extreme form of sedentarism, and a bodily inert future (2003). Similarly, architectural critic Martin Pawley (1998) saw ICTs as a pathway for individuals to retreat into an alternate cyber realm, and subsequently, away from physical presence and participation in urban public space. Pawley subscribed to the popular view that the corollary of cyberspace would be the diminished significance of the built environment, yet suggested that architecture and architectural practice might thereby shift accordingly. In similar ways—yet couched within broader concerns for society—Virilio foresaw the practice of design as one that would increasingly shift from "real space" to virtual space and become more concerned with the "control of the environment in real time" (2003, p.3).

What these early cyberspace imaginaries reflect is a conceptual polarisation of actual and virtual space. This corresponds to a long history of dichotomous frameworks that operate to order and define the boundaries between nature versus technology, natural versus artificial, and human versus post-human. Equally these earlier accounts of ICTs reflect a need to put technology in its place, or to allocate a particular space for the engagement with technology. For Carr et al. teleworking was seen as located in the domestic space of the home. In part, this necessarily aligned to the very nature of ICTs in the early 1990s as predominantly hardwired static desktop computers (PCs) that thereby rendered teleworking and online access as practices most likely to occur in the home. From Carr et al's perspective this left urban public space free to carry out its 'proper' role as a site of social-opportunity, but also and significantly as a space of respite *from* technology. With the home/workplace neatly ascribed as the place for technology, consequently urban public space became a technology-free space for 'authentic' and unmediated experiences.

A similar sentiment is evident in William J. Mitchell's *City of Bits: Space, place and the infobahn* (1995) where he argues that urban life could regain its peacefulness, as electronic communications would remove the need to physically travel. Virilio's (2003) terminal citizen is the counterpoint to these more optimistic accounts in several key ways. As a marked contrast to notions of peacefulness, the terminal citizen is pacified,

inert, and considered to be enslaved by the technologies of hyper-mediation and the 'speed-machines' that distort and reconfigure perception and experience. Yet, significantly Virilio argues that this dystopic scenario is not simply attributable to ICTs, but rather has developed over a considerable period of time. More specifically, Virilio's concept of 'dromology' describes the progressive development of speed-machines as including technologies from the Renaissance onwards, such as the telescope, the telegraph, the high-speed train, and telecommunication. Broadly, this contends that as the modern technologies of transmission and communication have developed increasing speed, subsequently our sense of presence and lived embodied experience has become increasingly compromised. Thus, speed machines are argued to have signalled the obliteration of distance and dimensions by realising the ultimate separation of the body from the 'direct' sensorial experience of space (1994, p.4).

Virilio's views are significant to this research as they represent a critique of modern technologies through the lens of movement and acceleration that is grounded in a phenomenological concern for the nature of experience and perception. While it may appear that Virilio is simply anti-technological, Ian James (2007) argues that his refusal of certain aspects of contemporary development is rather deeply phenomenological, and concerns an affirmation of "…the possibilities of the human body and the diverse ways it can be situated within space" (p.12). In his own defence, Virilio has stated that dromology was not intended as a direct attack of the internet or cyberspace, but rather as a way to be critical of "…the propaganda unleashed by Bill Gates and everything that goes with it" (2000, p.34).

As a critical approach, dromology calls into question our relationships to, and interactions with, technologies. Moreover, understood in liminal terms, dromology attempts to make visible the links between technological changes of pace, and social and political life, and by doing so, intends to challenge dominant and ideological paradigms (Armitage 2000; Bell 2007). This recalls the work of other critical philosophers including notably, Walter Benjamin (2008) who explored the role of technology in the organisation of perception in the early twentieth century.[3] Virilio

[3] Similar phenomenological accounts of mobility include Georg Simmel, sociological analysis of the alienating effects of the modern Western metropolis, and literary works such as Edgar Allan Poe's *The Man of the Crowd*, Virginia Wold's *Street Hunting*, and Paul Auster's *City of Glass*.

describes how extant ways of perceiving and measuring distance and time have been progressively transformed by accelerative physical-material movement as a dromoscopic restructuring. In extending this thinking to ICTs, the immaterial processes of rapid digital informational movement and transmission are described as enacting a teletopological restructuring (1994, p.7).[4]

More specifically, the ICT paradigm signals for Virilio a final estrangement from extant ways of knowing the world whereby the figure of the terminal citizen embodies the anxiety connected to a loss of control and unfamiliar practices. Ultimately, the terminal citizen represents a technological dialectic of movement and stasis; the ironic premise that high-speed information and communications transmissions can render the body inert. Significantly, while inertness can be understood in the physical sense of the body and individual experience, more broadly it describes the condition of the body politic as in a state of social and political apathy.

Therefore, while Virilio's technourban imaginary may appear cynical or dystopic, it points to the necessity to examine and challenge the status quo. It is considered significant in this thesis insofar as it adopts a phenomenological approach to make very different claims about human-technology-urban public space relations than those from within computer science, as for example Dourish (2001) and communications and media studies scholar Farman (2012a). In short, it offers a critical counterpoint to claims to the experiential and perceptual *enhancement* of urban public space through mobile technology practices.

5.3 From technologies of movement, to mobilised technologies

The ubicomp thinking that emerged from within the technical field of computer science represents a key shift in the technourban imaginary of the 1990s founded on a technological opportunism. Weiser and his colleagues at the Palo Alto Research Centre (PARC) developed ubicomp in an effort to extend the applications of computing beyond the desktop PC that in the 1990s represented the dominant mode of human-computer interaction. This alternate way of thinking computing envisions widely distributing computing throughout the built environment in unobtrusive ways. Yet, while ubicomp

[4] Note: The prefix 'tele' indicates far, or at a distance'.

imagined invisible computing, urban geographer Michael Batty (1990) speculated about the ways ICTs would alternatively render cities invisible.

In a 1990 edition of *Environment and Planning B: planning and design* Batty's article "Invisible Cities", that recalls Italo Calvino's novel of the same name, describes how immaterial flows of information enabled by networked computing would re-work the city in a multitude of new ways. In this sense the invisibility of the city did not refer to that which might be physically erased or disappear from view, but that extant and traditional ways of understanding the city—the traditional representations of the city—would disappear. Batty argued that the growing pervasiveness of ICTs in various contexts meant "…traditional procedures which we use in developing our understanding of how cities work are being undermined" (1990, p.130). This implied that the city would increasingly function according to the 'invisible' logic of digital information flows and to understand the functioning of this new city, required new ways of examining it.

Significantly, Batty recognised that the emerging digital informational landscape stood to meaningfully influence the socio-material organisation of space. Although invisible to the naked eye, networked flows of information and communications stood to reconfigure movement, transactions, interactions, and attention to the built environment. He envisioned that everyday practices and social spaces would be increasingly orchestrated through immaterial flows of information. In this way he understood that while the physical materiality of the city may not necessarily alter, its socio-material performance stood to radically shift through the reconfiguration and augmentation of information systems. As Mark Shepard would later observe, "… beneath the threshold of public vision, a new city [was] emerging" (2011, p.31).

That networked information can influence socio-material organisation, undermines the rhetoric of cyberspace as a substitute for actual space and sets up a different understanding of the relationship between ICTs and urban public space. While drawing clear theoretical distinctions between notions of ordinary physical space, (material/real) and immaterial (cyber) space, architectural theorist Michael Benedikt (1991), asserted

that cyberspace[5] could not replace the world of material objects, but rather constituted a force of displacement. Rather than a physical transformation, this suggests a cognitive shift in the value attributed to the world of material objects. Optimistically, Benedikt reasoned that this shift could catalyse a "renewed appreciation" for the material world (1991, p.4, 124).[6] Countering the sensationalist rhetoric of the disappearance of cities, Graham (1997) also reasoned that cities could not simply disappear as having (in many instances) evolved over centuries, "the dominance of cities [could not] be simply disinvented" (p. 45). Even from Weiser's arguably more techno-centric perspective, the future of computing stood to engage more significantly with the extant fabric of the built environment, entailing a dematerialisation of computing itself rather than cities.

As late as 1999 ICTs were still being linked to the so-called death of cities and public spaces.[7] Beyond the ardent belief in the resilience, durability and endurance of cities, claims of its imminent dematerialization came to be seen as reductive and technologically determinist. Furthermore, research by scholars such as Castells' (2009) actively set out to disprove the dematerialisation and substitionalist perspectives. Broadly, this research found that ICTs offer ways to supplement and augment, rather than replace, existing ways of working, learning, and living. For example, research undertaken in New York in the 1980s found ICTs were actually "slowing down corporate relocation away from New York" (Castells 2009, p. 408). In 1988 a leading European researcher commented that, "[t]here are more people doing research on telework that there are actual teleworkers" (quoted in Castells 2009, p.425).

While scholars such as Batty, Castells, Mitchell, and Graham each challenged the rhetoric of the decline of cities in relation to ICTs, nonetheless they argued that the growing pervasiveness of ICTs necessitated a rethink of the ways the built environment

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[5] Arguing for the continued relevance of the concept of cyberspace David Bell (2001; 2007) defines it along three lines: material, symbolic and experiential. In a material sense it can be argued to define the hardware and infrastructure that allows computers and their users to be remotely networked. In a symbolic sense cyberspace is "an imagined space between computers in which people might build new selves and new worlds" (2001, p.7). Finally, in an experiential sense cyberspace represents the negotiation between the material and symbolic elements.

[6] Benedikt further argued that cyberspace would function as an extension to an age-old need to "dwell in fiction" (1991, p.6), as a place for the playing out of mythic realities, this understands cyberspace as an extension of our imagination.

[7] See Kolko (1999) "The death of cities? The death of distance? Evidence from the geography of commercial internet usage" in *Cities in the Global Information Society Conference*, Newcastle-upon-Tyne.

could be examined and understood. These scholars called for built environment disciplines to more fully account for the various ways ICTs had, and would continue to, reconfigure the functions of Western cities. Mitchell (2000) described how ICTs constitute a "radically new logic governing the mix and distribution of living space, work space, and service locations within the urban fabric" (2000, p.6). Moreover, he foresaw that the transformation of the city lay in the ways the digital information network would necessitate the recalibration of extant "formal structures of power" (2007, p.189). As such, the narrative that ICTs would 'transform' the Western city began to be told in different ways.

5.4 Mobilising computing

The production, interaction, and significantly, the *movement* of information made possible through digitally networked technologies are now central to claims about the transformation of cities and urban public space. The notions of movement and mobilisation characterise two key phases of computing's extended reach into objects and the built environment. In the earlier phase, the still distinct technologies of computing and telecommunications had both begun to move away from their initial industrial, domestic, and workplace applications and settings. Yet, in the teleworking sense, while computing had *moved,* it remained otherwise immobile. Computing also remained conceptually orientated towards workplace objectives of efficiency and productivity. By contrast, the second phase of mobilisation saw the applications of computing extend to many everyday practices, subsequently enveloping a much wider user-demographic.

The mobilisation of computing corresponds to a key ubicomp objective as computing applications are targeted at intervening in the ways people negotiate, engage with, and appropriate, the social, and built environment. In short, intervening with how people engage with space (Wilken 2007; Sikka 2011). As a result, the already tenuous concept of cyberspace as a separate realm of autonomous, self-governing action lost further credibility. Phil Agre (2004) reflects that as "[c]omputing…is increasingly about the activities and relationships of real life…the boundary between the real world and the world of computer-mediated services is steadily blurring" (p.416). Subsequently, computing's move away from the dominance of the desktop PC interface, and the

perceived diffusion of computational processes into the everyday realm, has been identified as a paradigmatic cultural shift (Agre 2001, 2004, Mitchell 2003; Greenfield 2006; Picon 2011; Farman 2012a).

While wireless technology brought a new visibility to computing practices in urban public space, the more visible practice of mobile telecommunications encouraged new modes of situated research that addressed issues of urban space and geography in disciplines not previously concerned with such matters. Lara Sirvastava has reflected that,

> *"[t]he phenomenal spread of mobile and Internet technologies and applications are unprecedented in any other domain of human activity…Even the rapid expansion of the Internet was exceeded by the lighting speed of the mobile phone's dramatic uptake. One might find a mobile phone in remote villages of the developing world—the same is not true of the Internet" (2008, p. 15).*

Srivastava highlights that while internet-activity growth slowed at the turn of the millennium, conversely mobile phone growth surged (2008, p.15). As mobile phone uptake rates doubled exponentially with each year after 2000, many researchers previously focused on Internet Studies and online culture such as Howard Rheingold (2003) subsequently migrated their focus to mobile communications studies (Ito, Okabe and Matsuda 2006, p.5). With the dominant visibility of mobile phone engagement in urban public space, attention from social and cultural studies scholars seeking to explore related social practices and behaviours grew. From a research perspective, the visible incursion of a host of mobile digital devices in everyday situations and, notably, in urban public space has offered clear opportunities to observe and study such phenomena. Yet studying mobile communications has also demanded a different approach to research and theory than that of Internet Studies, and has necessitated new assemblages of interdisciplinary knowledge. Consequently, this has brought the disciplines associated with computing, media and communications studies, and urban and architectural design into a new field of relationships (Ito, Okabe & Matsuda 2006).

5.5 Mobilising communication: incursions and transformations

In 2000 Anthony Townsend declared that new mobile communications systems were "…fundamentally rewriting the spatial and temporal constraints of all manner of human

communications—whether for work, family, or recreation and entertainment" (2000, p.89). Such claims were supported by pioneering studies of mobile telecommunications research conducted in countries where mobile telecommunications had registered rapid adoption rates including, Scandinavia, Korea, and Japan (Kopoma 1999, 2004; Ito, Matsuda and Okabe 2006).[8] This early research, as well as significant survey work of scholars such as Sadie Plant (2001), served an epideictic function. Providing various accounts of mobile phone engagement, including everyday expressions by ordinary people, served to legitimise mobile communications as an important cultural force as well as object of study. Additionally, at a time when "expert discourse" in this area was considered relatively "impoverished", the edited publication *Perpetual Contact: Mobile Communication, Private Talk, Public Performance* (Katz and Aakhus 2002) addressed how the mobile phone had become a prominent fixture of everyday life, and had impacted extant social practices and social etiquettes.

While many of these earlier studies are of interest here, more relevant to this research are those that address the ways mobile communication practices affect shifts in both individual and social perceptions of public and private space. In ways similar to the impacts of the transportation technologies of the twentieth century, the impact of mobile communications is often discussed in terms of its capacity to compress time and extend place. In one way this has been framed as incursion into one's private life and the subsequent loss of leisure time, while conversely it is argued to have allowed greater control over the management of an individual's time and space. This polarisation of positions is explicitly expressed in the title of Richard Ling and Scott Campbell's 2011 publication *Mobile Communications: Bringing us together and tearing us apart.* These twin and polarised positions both connect to broader assertions that modern communications have contributed to an "erosion of the public-private distinction" (Katz and Aakhus 2002, p.8), and more broadly, "that the use of communicative technologies has modified the relationship of modern citizens with space and time" (Fortunati 2002, p.513).

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[8] The significance and scope of this early research is evidenced by the range of International conferences established in early 1990s dedicated to the exploration of mobile communications including the IEEE International Conference on Communications, IEEE International Symposium on Personal, Indoor and Mobile Communications and the ICC International Conference on Mobile Communications, to name a few.

A survey of key research material related to mobile communications' capacity to affect a modified or transformed relationship to space and time is reflected here by three key themes, including:

Encountering—observations of individual and social practices, including ways of moving and practices of attention, as well as alternate forms of social organisation;

Negotiating—observations of changed perceptions of time particular with respect to social organisation, social etiquette and the concept of 'being-there';

Appropriating—observations of the practices of spatial occupation, and the question of altered behaviours and perceptions of public and private space.

5.5.1 Encountering

Mobile digital communications have afforded more fluid and accessible forms of communication from non-fixed locations with remotely-located others. Given the significant shift in the practice of calling from and to a fixed landline location, to calling a mobile person at an unspecified geographic location, research initially focused on how this affected the configuration of social relationships. The category of 'Encountering' in this chapter refers to research that has addressed how mobile communications impact how people move through space in terms of their behavioural and bodily encounters as well as the interactional possibilities they afford or negate. Collectively these studies point to the ways mobile technology practices might 'transform' public life insofar as it is played out through interactional possibilities in urban public space.

Many early studies of mobile communications activities in urban public space focused on how the use of a mobile device could affect the way people moved, and subsequently their practices of attention toward others as well as the built environment. Katz and Aakhus (2002) describe how they sought to explore the ways "social arrangements in physical space were transformed through mobile communications, but also the ways they had remained unaffected" (2002, p.xxi). Observationally, mobile technologies practices while on-the-go reflect a 'heads-down' approach [Figure 3.0]. This describes a tendency for mobile phone users to be intently focused on screen-based content while moving. Researchers speculate that this reduces the user's field of vision, potential for

person-to-person eye contact, as well as the sensory capacities that enable proximity awareness, that is, the perception of where the body is in relation to other bodies and objects. Adam Greenfield and Mark Shepard (2007) describe this phenomenon in an observational study of mobile communications in a public shopping area. They refer to the mobile-user who is moving about the space, as behaving in a "drunken-seeming-meander", and thus appearing to be ambivalent to her immediate physical surroundings and co-present others (2007, p.34-35).

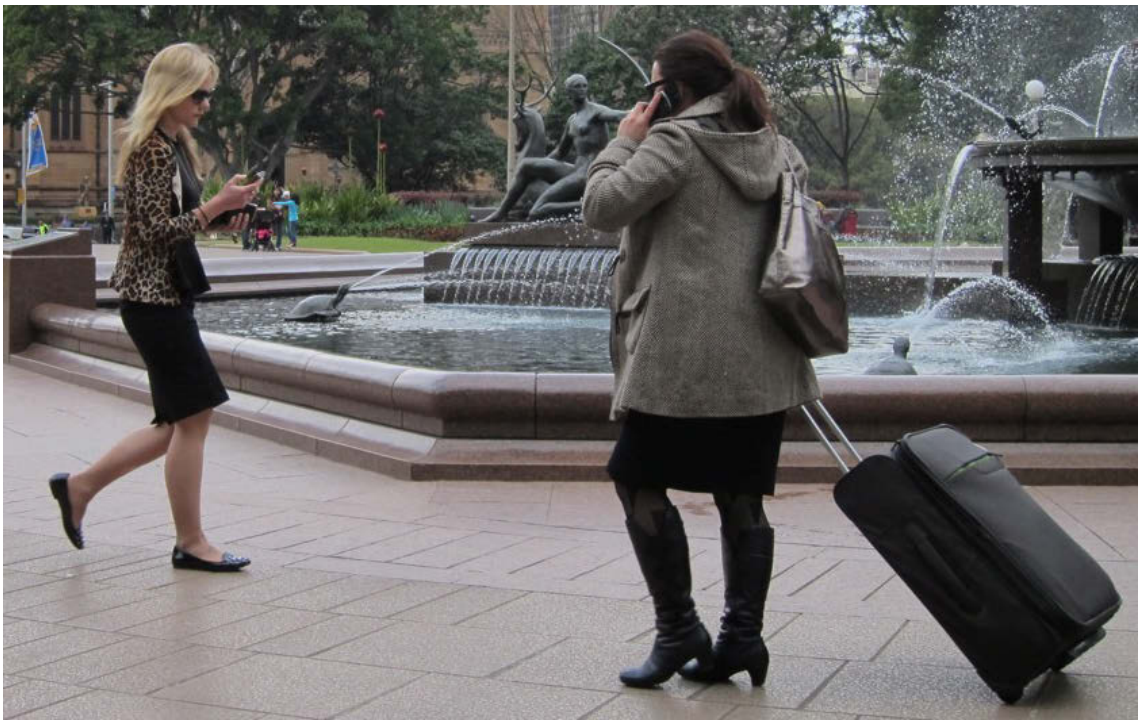

Figure 3.0 'Head's down' mobile technology practices, Hyde Park, Sydney.

Mobile technology practices are popularly held to disrupt patterns of physical movement, and thus social interactional possibilities with co-present others. Underscoring the view that mobile communications diminish opportunities for social interaction, are several key concepts including 'telecocooning' (Habuchi 2006), selective sociality, social privatism and monadic clusters (Gergen 2008) and in short a 'new insularity' (Gergen 2010). These phrases infer that mobile communications disrupt the opportunities for social interaction in urban public space yet afford opportunities for privacy. In ways counter these claims, Willis (2008a) has argued that mobile technology practices can also encourage a slower pace of movement, and often require users to seek out places to stop in order to pay closer attention to the device itself. This, she suggests, is at odds with the ideological notions of mobile device use that expect "…the person on

the move, flicking between flows of information whilst walking through the public spaces of the city" (Willis 2008a, p.24). This perspective is further supported by Sven Kesselring (2006) who argues that passive engagement in physical urban space does not necessarily equate to reduced socialisation and vice versa. As scholars from within the mobilities paradigm attest, contemporary mobility imperatives associated with mobile communications also produce *new* socio-spatial constellations. Kesselring (2006) writes that there are now "new ways to be mobile and realise social belonging without being bound to place" (p.277). And further that, "individuals are…finding ways to be connected without meeting" and that this demonstrates a "decoupling of spatial and social mobility" (p. 277).

To further challenge claims that mobile communications remove opportunities for co-present social interaction, Erving Goffman's (1963) sociological theory and study of individual and group behaviours in public spaces offers insight. Of note is Goffman's concept of "civil inattention" that describes a common idiosyncrasy reflected by people residing in public spaces (1963, p.83). This also relates to the concept of demonstrated awareness, and concerns how people can be generally *open* to co-present others but will also adopt strategies to organise and maintain their levels of civil disengagement. In other words, the concept of civil inattention describes the ways people establish a 'comfortable' distance between themselves and others. As a specific example, Goffman pointed to how people use certain objects, such as books and newspapers, as "involvement shields" to organise and define a private space within a public space (1963, pp.38-42). From this perspective it is reasoned that contemporary mobile devices are involvement shields that form part of strategies of demonstrated awareness in ways not dissimilar to people's use of other 'technologies' such as printed media. That mobile phone users give priority to phone communications over interactions with co-present others is further reasoned to reflect how people use the mobile device as a way to distance themselves from the possibility of interaction with 'strangers' (Ling 2002; Hampton et al. 2010, p. 705). Aligned to this approach, Kenneth J. Gergen's research historicises the notion of divided or diverted consciousness and proposes the concept of "absent-presence" (2002) that is enabled by mobile telecommunications.

On the other hand, researchers conversely claim that mobile technology practices afford the expansion and diversification of a person's social ties and communities, and in

short, can promote the building of social capital. Yet, this runs counter to early empirical research studies on mobile communications that indicated that despite the extended connectivity the mobile device purportedly afforded, existing social networks established in more traditional settings such as school and the workplace were more likely to be reinforced rather than extended (Ito 2006). Furthermore, results from studies on text messaging have shown that messages are chiefly sent to a core group of three to five intimates (Ito 2006, p.9). These outcomes reinforce Wellman's (2002) concept of "networked individualism" that argued digital information and communications technologies would affect a growing trend towards a selective sociality. This claims that while social ties and communities would not necessarily be contingent on geographic or spatial proximities, that given they would tend more towards individual preferences this thus reduced the opportunity for exposure to difference and otherness.

In both behavioural and social terms many studies point to the ways that mobile technology practices affect patterns of encounter and the likelihood of engagement with both co-present and absent others (Hampton et al. 2010). Furthermore, notions of decreased situational awareness have been associated with a reduced attention to others and the built environment that is often taken to evidence the diminished vibrancy of public life. The condition of decreased situational awareness is aptly parodied by the *Improveverywhere* group who posed as "seeing-eye-people" for mobile device users in New York City in 2013.[9] Similarly, the more recent example of the implementation of "texting lanes" [Figure 4.0] in Antwerp, Belgium,[10] and Chongqing, China,[11] pavement embedded traffic lights for smartphone users in Augsburg, Germany,[12] [Figure 5.0] smartphone warning signs in Seoul, South Korea,[13] [Figure 6.0] and public health warnings about excessive smartphone use in Bangkok, Thailand [Figure 7.0] suggest that, in the public imagination, mobile technology practices cause people to adopt new

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[9] https://improveverywhere.com/2013/04/30/seeing-eye-people/ Last viewed12 January 2017.
[10] http://www.telegraph.co.uk/news/worldnews/europe/belgium/11674215…duces-text-walking-lanes-for-pedestrians-using-mobile-phones.html Last viewed 20 October 2016.
[11] https://www.theguardian.com/world/shortcuts/2014/sep/15/china-mobile-phone-lane-distracted-walking-pedestrians Last viewed 12 January 2017.
[12] https://www.washingtonpost.com/news/worldviews/wp/2016/04/25/this-city-embedded-traffic-lights-in-the-sidewalks-so-that-smartphone-users-dont-have-to-look-up/?utm_term=.24fd793c9ba7 Last viewed 12 January 2017.
See also plans for Australian cities: http://time.com/4356202/australia-to-install-pavement-traffic-lights-for-distracted-smartphone-users/ Last viewed 24 January 2017.
[13] http://www.bbc.com/news/blogs-news-from-elsewhere-36576259 Last viewed 20 October 2016.

ways of moving through, and paying (less) attention to, the conditions of urban public space. However, does the diversion of attention to a mobile screen necessarily equate to a reduction in the quality of public life?



Figure 4.0 Visualisation of a dedicated texting lane.

Figure 5.0 Pavement warning lights, Augsburg, Germany, Belgium. Source: swa/Thomas Hosemann.

Figure 6.0 Pilot project for smartphone warning signs, Seoul, South Korea.
Source: Seoul Metropolitan Government http://english.seoul.go.kr/new-traffic-signs-smartphone-users/



Figure 7.0 Public health warnings signs for mobile phone use, Bangkok, Thailand.

From an academic perspective, and in a recent long-range observational study undertaken by Hampton et al. (2015) that examined 30 years of video footage taken in urban public spaces in the USA, the authors conclude that people have become “less

socially isolated in public spaces", and moreover, that this has little to do with mobile phone engagement (p.1489). Other factors, such as the increased percentage of women in the workforce over the survey period are argued to have more significantly impacted the conditions of public life. While this study supports claims that mobile technology practices do not impede the social aspects of public life, more importantly, it also suggests that they have little impact on its 'enhancement'. This study is significant to this thesis in two key ways. Firstly, this relates to the extensive length of the study. Given the duration of footage of over 30 years this affords the possibility of meaningful comparisons. Secondly, and in ways that stand apart from many contemporary empirical studies of mobile technology practices where interview participants are frequently less than 30 people, Hampton et al.'s study observed and coded 143,593 people from video footage. While observational studies inevitably make assumptions about people's behaviour, whereas interview methods can solicit a higher degree of certainty, nonetheless the scale of Hampton et al.'s study adds significant weight to their views on the impact of mobile technology practices on the social conditions of contemporary urban public space.

5.5.2 Negotiating

Research has also pointed to the ways that mobile communications have afforded new forms of flexible organisation or loose coordination and subsequently a more elastic sense of time (Urry 2007). Anthony Townsend (2000) reflected that with mobile phone connectivity, "[t]he old schedule of minutes, hours, days, and weeks becomes shattered into a constant stream of negotiations, reconfigurations, and rescheduling" (p.94). In their study of Norwegian teen's mobile phone use, Ling and Yittri (2002) coined the concepts of micro and hyper coordination, while Fortunati (2002) described the mobile device as a new strategic time management tool whose mobility and flexibility of use could make time more productive. In a sociology-led study of teenage Japanese mobile phone culture Ito et al. (2006) describe how the values of organisation and 'on-time-ness' had shifted with the affordance of easily contacting the person to rearrange with a mobile phone. Amongst the teens they observed in the densely occupied and complex city of Tokyo, one was not considered 'late' to a meeting if they were alternatively participating virtually. For the Japanese study participants, mobile communication had become a proxy form of participation. Reflecting on this study, Brewer and Dourish

(2008) note that being virtually present had come to be considered as a socially accepted and alternate form of "showing up" for an appointed gathering time (p.7).

In line with such observations Sven Kesselring argues that "new technologies provide people with the potential to substitute other modes of presence, absence, proximity and distance" (2006, p.276). Equally, Mitchell (2005) describes a growing anywhere-anytime-culture, arguing that mobile technologies make possible, but also more culturally acceptable (at least to younger generations) modes of last minute rescheduling. More broadly, Kopomaa (2004) argues that the mobile enables a shift from the rhythmic space-time routines of the post-war city—with unpredictable encounters on the street—to a city of flexible, but highly coordinated encounters. He further reflects that

> *"the postmodern information society facilitates living a life of both continuous presence and of complete mobility…The mobile phone has contributed to the reorganisation of work and leisure. It has created flexible schedules, increased information exchange…The mobile phone has become one of the central symbols of the new urban culture and lifestyle" (2004, p. 268).*

5.5.3 Appropriation

The theme of 'appropriation' concerns how mobile communications are argued to have impacted the way people use space, potentially in ways different than intended by designers and policy-makers, and in ways that consequently 'loosen' established understandings of urban public space [Figure 8.0]. Mitchell argues that mobile communications operate in ways that "…scramble familiar spatial categories by extending the range of activities that an individual can engage in anywhere, at any time, and they enable new forms of social coordination and control by providing continuous accessibility, tracking, and verification of identity" (2005, p.x).



Figure 8.0 Mobile technology practices, Darling Quarter, Sydney.

Observations of early mobile communications in public spaces were largely drawn from several key studies undertaken in countries that exhibited rapid uptake rates of mobile phone use, such as in Scandinavia, Korea, and Japan. While many of these focused on communication between various social groups and the nature of their social ties, Ito et al. (2006) were among the first to connect their studies of mobile communications related behaviours to both social practice as well as subjects of urban space and geography. Adopting a social construction of technology approach, the term "technosocial situations" is described as a "frame for practices that hybridise technological, social and place-based infrastructures" (Ito 2006, p.13). Such an approach not only takes into account the physical locations of users, but also sees the mobile device as a significant component of a larger socio-technical kit of parts. This extends the examination beyond how people operate mobile devices within particular settings, to how these settings—social and spatial—might be actively (re)constructed through mobile technology practices.

Ito and Okabe (2006) also note that initial studies on mobile communications in public space had tended to frame such studies in terms of disruptions to existing patterns of use, behaviour and established rules of etiquette. By contrast, their alternate focus considered how "settings could be constructed by the mobile phone communication itself" (2006, p.258). In addition to undermining prior definitions of social situations, they further argued that mobile phone use could define new boundaries of place (2006, p.260). This reasoning proposed that mobile communications enable new kinds of social settings that differ from, or are not compatible with the boundaries of conventionally understood spatial typologies such as the workplace, home, and restaurant, which suggests that electronic media enables a traversing of the boundaries between situations previously held to be distinct.

Drawing on Ray Oldenburg's (1982) socio-spatial theory, Kopomaa (2004) has argued that the use of mobile phones in urban public space can generate a "third place"; a place of withdrawal distinguished from either the home or the workplace (p. 268). Similarly, Hulme and Truch (2006) have theorised that mobile communications engagement produces transform the nature of "interspace" that exists *between* the more established and formalised social fields of the home, the workplace and social life (p.49). Drawing on Pierre Bourdieu's (1990) concepts of habitus and field, it is reasoned that mobile communication with non-present people during transit transforms the nature of interspace into a space in which many fields of action and overlap (2006, p.49). Similarly, Fujimoto (2006) has described the mobile phone as a "territory machine" that is capable of inducing a transformation, for the individual user and potentially others, in the perceptual understanding of space from 'public' to 'private' (p.77).

Along similar lines, sociologists Mimi Sheller and John Urry (2003) have argued that as informational systems have become increasingly mobile and embedded in mobile devices, carrying such devices can affect a complex de-territorialization of publics and privates. More specifically they have argued the mobilisation of information produces "new hybrids of private-in-public and public-in-private" spaces (p.108). Further, they argue "[c]ars, information, communications, screens, are all material worlds, hybrids of private and public life" (p. 113). This understands the hybridization of public and private space as more extensive than simply any given technology, and their constitution occurs in more complex and fluid ways. In this way, mobilities are argued

to be central to the reconstitution of publicity and privacy. Yet, significantly, they further note that "public and private life have always been mobile, situational, flickering and fragmented…automobility and information technology [are] two key elements of modernity that have ambivalent effects on cultures of democracy" (Sheller and Urry 2003, p. 114).

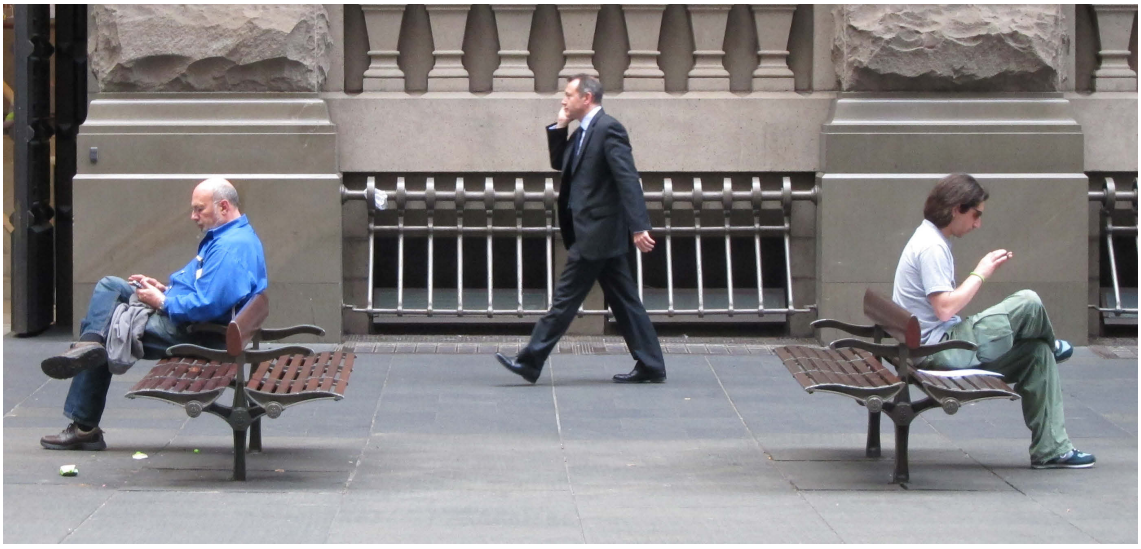

Figure 9.0 Mobile technology practices, Martin Place, Sydney.

More recently Hampton et al. (2010) have referred to mobile communications engagement as an activity that produces temporary "privacy bubbles" or "pockets of privacy", that penetrate or protrude into what is otherwise popularly considered to be public space. They reason that "these bubbles provide the individual with a space of comfort, familiarity, and security within what is primarily a realm of strangers" (2010, p. 705).



Figure 10.0 Mobile technology practices creating privacy bubbles in the State Library of New South Wales, Sydney.

5.6 The everyday

The range of academic research that has explored mobile communications practices to date, in addition to the numerous conferences and publications produced across varied disciplines, has served an epideictic function. That is, providing accounts of mobile communications practices—including everyday expressions by ordinary people—serves to legitimise mobile communications and mobile media as not only a valid object of academic research, but also and relatedly, as one that can be reasoned to be a significant cultural force (Katz and Aakhus 2002, p.6). Particularly, the notion of the 'everyday' is a key rhetorical term that is frequently connected to the reasoning of mobile technology practices as pervasive and culturally significant.

To describe smartphones as everyday objects, and mobile technology practices as everyday activities, locates them firmly within the tradition of material culture studies, where the investigations of 'things' and material practices are central to understanding everyday life. Conversely, and as Sanford Kwinter (2015) has recently argued, the very pervasiveness, or ubiquity, of mobile technology practices in daily life can contribute to

rendering such phenomena *less* visible. More specifically this understands the everyday to connote a state of normality, banality, and routineness associated with wide-scale and habitual use. In this respect, framing mobile technology engagement in everyday terms equally suggests that such activities face a risk of receding from scholarly attention and a more critical gaze.

To question what seems so much a matter of course that its origins have been forgotten is the clarion call of French writer George Perec (1973). In his 1973 essay "Approaches to what?" Perec argues that the banalities of the everyday—the trivial and the futile—are under-appreciated facets of daily life. Moreover, he calls into question the emphasis placed on the extraordinary, the spectacular and the uncommon in everyday life. Perec describes how the minutiae of daily life has been overshadowed by the tendency of the media—television, radio, and print—to focus on the "big event, the untoward, the extra–ordinary: the front-page splash, the banner headlines" (2002, p.177). Likewise, he notes that in this media dominant context, a subject's existence is often defined by its failure; "[a]eroplanes achieve existence only when they are hijacked" (2002, p.177). Ultimately, for Perec the everyday assumes significance precisely because it is habitual, and he calls for its due consideration and representation.[14]

> *"… the rest, all the rest, where is it? How should we take account, question, describe what happens everyday day and recurs everyday day: the banal, the quotidian, the obvious, the common, the ordinary, the infra-ordinary, the background noise, the habitual?" (Perec 2002, p.177).*

Yet far from critically questioning "that which seems to have ceased to forever astonish us" (Perec 2002, p.178), the argument that mobile technology practices are part of the everyday can be seen as a tactic to normalise their invasive presence in people's lives. Notions of the everyday are connected to claims that mobile digital technologies are increasingly owned and used by a wider demographic and thus diverse social stratum. Ito alludes to this when describing the noticeable shift in research focus from internet to

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[14] In *An Attempt at exhausting a place in Paris* (2010) written in 1974, Perec argued that "There are many things in place Saint-Sulpice…A great number, if not the majority, of these things have been described, inventoried, photographed, talked about, or registered" (p.3). Alternatively he proposed to, "… describe the rest instead: that which is generally not taken note of, that which is not noticed, that which has no importance: what happens when nothing happens there than the weather, people, cars, and clouds" (Perec 2010, p.3).

contemporary mobile communications culture at the turn of the millennium, noting that "[u]nlike the Internet, created by a relatively narrow and privileged social band (predominantly educated, white, male, North American), mobile technology owes not only its uptake, but its actual form to people more on the social and cultural peripheries" (2006, p.7).

More generally, the everyday has been adopted to explain a shift and differentiation in technology use from specialised skills, interests and practices, to its everyday use, participation, and influence. Indeed, suffusing everyday life with computational possibilities is a foundational aim of the ubicomp paradigm; to extend computation beyond institutional and commercial contexts, to become distributed, and embedded into wider contexts of the built and urban environment, and significantly, in daily life. From the ubicomp perspective the everyday represented an untapped sphere of habitual, mundane, menial, and time-consuming activities ripe to be optimised through a host of computational processes and an ensemble of digital technologies.

The notion of the everyday also finds service in underscoring political beliefs and positions. Many scholars have connected the everyday with emancipatory thinking and subversive potential. While Lefebvre (1991b) recognised the slipperiness of the concept stating that, "… there is a certain obscurity in the very concept of everyday life. Where is it to be found? In work or in leisure?" he also saw the everyday as constituted by a broad range of interactions across the spheres of work, leisure, and family life, as well as moments lived outside of culture (p.31). To further narrow this definition he described the everyday as that which is residual and left over "…after all distinct, superior, specialized, structured activities have been singled out for analysis…Everyday life is profoundly related to all activities, and encompasses them with all their differences and their conflicts" (Lefebvre 1991a, p.97). In this way Lefebvre's adoption of the everyday, and of everydayness, communicated particular political notions rooted in Marxist origins.

For Lefebvre the 'everyday man' was the man of praxis, and praxis formed the path to freedom from alienation and the attainment of the concrete totality of the 'total man' (1991a, p.xx). He believed that the objectives of socialism could only be realised by addressing and changing everyday life. The everyday denoted grounding in reality

through the understanding of 'real' individuals, and the activities and the material conditions under which they live. The everyday in this sense was believed to hold the radical potential to bridge the separations established between abstract processes and concrete life. Yet this reference to real individuals and everyday practices primarily addresses the working class, and in this interpretation the everyday becomes narrowly class-specific and an ideological concept to serve those considered oppressed by capitalist modes of production.

Following Lefebvre, Situationist International member Guy Debord distinguished the everyday as "whatever remains after one has eliminated all specialized activities" (quoted in Goonewardena 2008, p.124). Yet as Goonewardena notes, this is a convenient reading and "…everyday life cannot be characterized only as such, because a vital, indeed growing, part of it also lives under the shade of those "elevated activities" (p.144). Hence the need to define everyday life as "doubly determined"—both as the "residual deposit" and as the "product" of all "elevated" activities" (Goonewardena 2008, p.144).

From an anti-Marxist and anti-totalizing position, Michel de Certeau (1984) also saw the everyday as a realm of resistance. As an alternative to the idea that consumerism is a passive culture, he described consumption as tactic of resistance to deflect the power of dominant orders. This approach closely aligns to Perec's elevation of habitual practices, with the activities of walking, reading, decorating, and cooking regarded as having radical potential. In this sense the everyday is afforded the status of the 'real'—that which is actually happening and being experienced first-hand, over the condensed and packaged events reported by, and consumed through, mass media.

Describing mobile communications in terms of the everyday also alludes to democratic notions of freedom and liberatory potential. Internet media studies scholar Maria Bakardjieva (2005) takes up both Lefebvre's (1971, 1991a)[15] critical position on the

[15] In 1958 Lefebvre argued that studies of everyday life were popularised from 1937 onwards (1971, p.7).

everyday, as well as drawing on the phenomenological sociology of Alfred Schutz (Schutz and Luckmann 1973), to argue that the everyday use of digital technologies serves to distinguish these practices from those formally defined through disciplinary or institutional frameworks. She further asserts that recognising the everyday use of digital technologies affords (and potentially restores) a particular form of individual agency to the user. Moreoever, Bakardjieva argues that framing mobile technology practices as everyday resets long-standing asymmetric perspectives of human-technology relations, where the power has often been perceived as resting with either the technology itself or the producer (2005, p.37). More generally, Bakardjieva asserts that attention to the everyday use of digital technologies productively "…distinguish[es] the position of the user of technology…from the organizational contexts in which development, design and production of technology takes place" (2005 p.37).

Connecting mobile technology practices to the notion of the everyday may appear to be an innocuous observation, yet on inspection and as this section has discussed, the everyday can be seen as a trickster tactic in the liminal sense, as a concept that conceals ulterior motives. This is understood in the ways the concept of everyday casts a normalising pretence over the pervasive presence of technology in people's day-to-day lives. Consequently, rather than asserting that mobile technology practices constitute *new* spheres of action, or replace existing ones, this discursive trend points to the ways they are enfolded into prevailing and everyday practices, and in the ubicomp sense, operate in the background and make life 'easier'. On the other hand, following Bakardjieva (2005), Lefebvre (1991b) and de Certeau (1984), the everyday can be taken up as a politically charged concept to present a different way of conceptualising human-technology-environment relations and the agency of the user. From this perspective, where mobile technology practices are argued to play-out in the realm of the everyday they can be seen as distinct from structured intuitional frameworks, and can thus be argued to constitute liminal triggers.

5.7 Mobile Technology Practices

The phrase 'mobile technology practices' is adopted in this thesis as a conceptual umbrella to encompass the plethora of behaviours and conditions associated with mobile digital technology engagement, and namely the smartphone. In this way, this

does not privilege any particular technical characteristic, but rather as per Turner's (1986) understanding, draws focus to experience as a relational construct of many parts. Additionally, the affix of 'practice' conveys various layers of meaning. In one sense, the term practice acknowledges how contemporary mobile technology engagement is regarded as a culture force (Brewer and Dourish 2008). Equally, as the reference to practice recalls Lefebvre's (1991b) notion of spatial practice (perceived space) and the realm of bodily perception as "the practical basis for the perception of the outside world", this suggests mobile technology engagement figures in our ways of seeing and understanding the world (1991b, p.40). Additionally, the notion of practice references de Certeau's (1984) position on the critical potential of the everyday and gestures to the political dimension. Expanding the understanding of practice to consider questions of perceptions and sites of resistance offers further ways to explore how mobile technology practices might affect a transformation of urban public space.

Lefebvre's spatial theory is particularly relevant here as it asserts the *processual* and plural nature of space, that is, it considers how material and immaterial conditions—lived action, ideas, social structures, attitudes and practices—are interconnected processes in continual modes of becoming. In an operative sense, when applied to the subject of mobile technology engagement, this provides a way of extending beyond technical perspectives by refracting it through three key spheres. Subsequently, mobile technology practice is interpreted as a set of expectations (social, cultural, technical), a bodily experience, and an observable reality. This perspective brings additional layers of consideration to the critique of how mobile technology practices affect a transformation of urban public space. More specifically, it spurs the question, for whom is this so-called transformation perceivable, in what ways is it purposefully engineered and how do mobile technology practices enact, reinforce, or push against pre-conceived expectations? This further asks, in what ways do mobile technology practices resist established and hegemonic rules, behaviours, and representations of urban public space, or conversely, reinforce them?

Resistance figures strongly in de Certeau's (1984) notion of spatial practice, where the innumerable practices of everyday life, or "ways of operating", are cast as a means for users to "appropriate the space organized by technologies of sociocultural production" (1984, p.xv). In this sense, spatial practices refer to the actions of everyday city

dwellers; ‘consumers’ who move about the city and whose paths “trace out the rules of other interests and desires that are neither determined nor captured by the systems in which they develop” (de Certeau 1984: xviii). Furthermore, everyday spatial practices are regarded as those that are “foreign to the “geometrical” or “geographical” space of visual, panoptic or theoretical constructions” (p.93). Subsequently, everyday activities including walking, cooking, and eating are referred to as embodying subversive potential.

Given mobile technology practices commonly relate to the local scale of the walker, (but also phenomenal movement through computing), and are made up of interactions that often occur on-the-go and in-between places, it is possible to conceive of them as potentially *critical* acts of spatial production (1984, p. 97). This builds on the initial hypothesis that mobile technology practices constitute liminal triggers and speaks to their potential to realise forms of critical and subjunctive action.

5.8 Encountering, negotiating, appropriating, and transforming?

This chapter has set out a significant shift in research and discourse that links the subjects of technology and public space with notions of urban transformation. In the early 1990s architectural and urban discourses focused on predicting the ways ICTs would impact the more generalised site of the city, while the social and cultural sciences explored the new social configurations enabled through ICTs and early internet platforms. With the introduction of mICTs in the late 1990s a critical subject and scale shift occurred as scholars within the social and cultural sciences directed attention away from ‘aspatial’ internet studies and towards mobile communications and the contexts of their use, namely urban public space. While these studies lend far less emphasis to conceptualising changes to urban public space, their focus on social organisation and behaviour point to shifts in what it means for people to be in public, including changes in the performance of public life and consequently changes in the expectations people hold of public and private space.

The examination of discourse on ‘pre-smart’ mobile communications practices identified three key themes of socio-spatial transformation and described these under the headings of encountering, negotiating, and appropriation. These studies point to the ways mobile communications engagement can be understood to reconfigure socio-

spatial organisation, rework notions of presence or 'being-there', and complicate practices of attention. In this way mobile communications are argued to have fundamentally altered long-standing notions of social etiquette—the ways people behave individually and towards each other, and how they make decisions about what is important to them—value attribution and volition. Equally, these studies point to epistemic shifts, as ways of knowing—and not knowing—are mediated through mobile communications practices.

The discourse examined here evokes notions of liminality in the ways that mobile communications practices are described as reworking long-standing and tacit understandings of socio-spatial interaction, attention, and behaviour in urban public space. Given research practices often seek to validate or dispute prior claims, this provides a necessary foundation for understanding and evaluating more recent assertions that connect post-smart mobile technology practices to notions of radical urban transformation. This suggests that the seeds of change, or the liminal triggers, lie in earlier practices associated with mobile communications technologies, but can equally be conceptualised as extending as far back as the telephone and telegraph. With consideration of the processual notion of liminality, this attends to the 'when-ness' of transformation, and the 'completeness' of the transformative process. Indeed, seen from Virilio's perspective, who historicises a far longer arc of technologically-driven transformation, mobile technology practices do not represent a fundamental break with the past, nor a radical disruption or transformation in ways of knowing, but are rather the inevitable and iterative consequence of an incessant drive towards speed in all facets of life. In this way, and to adopt ICT parlance, the selected discourse examined here simply describes a dromological 'update'. And as the notion of liminal transformation lies in a processual transience to a final state of re-aggregation and the 'restoration' of social order, this further suggests that while urban transformation might be proximate it is not guaranteed.

Chapter 6: Mobilising Meanings

"…the smartphone becomes an intelligent compass, guiding the city dweller through the bustle and chaos of everyday life" (de Waal 2014, p.9).

This chapter builds on the examination of discourse in chapter 5 that charted a significant scale shift in thinking on the relationships between technology and public space in the context of urban transformation from speculative accounts of ICTs impact on the generalised site of the city, to the human-scale focus and empirically-driven analysis of pre-smart mobile communications practices. This chapter examines a selected range of post-smart discourse, and in particular accounts from within the field of communications and media studies, that connect notions of radical urban transformation to the affordances of the 'smart' mobile interface and its particular feature of 'location-awareness'. Whereas the pre-smart mobile communications research described in chapter 5 conceptualised urban public space as chiefly a frame for sociotechnical action, this chapter identifies how post-smart discourse directs far greater attention towards the conditions and qualities of urban public spaces and the ways they are mediated and constructed with and through mobile technology practices. This highlights how mobile technology practices have come to be alternately, and often favourably or optimistically conceptualised as 'locations-focused'. The discourses under examination here revisit modes of speculation as scholars including de Souza e Silva (2012), de Souza Silva & Frith (2012), Farman (2012a; 2012b), Humphreys (2010), Humphreys & Liao (2013, 2011), Liao and Humphreys (2015), Picon (2015), Wilken (2008) and Wilken and Goggin (2015) advance the position that LBS-led mobile technology practices have transformed the processes of urban public space interpretation, meaning-making, and value-attachment. While these claims of technologically-driven urban transformation extend to philosophical considerations of being and meaning-making, they also enter into the challenging realm of researching the individual experience of urban public space. This chapter underscores the opportunities for further empirical studies led from within the built environment disciplines to explore the ways mobile technology practices mediate place attachment.

6.1 Mobilising information

Several key and related shifts have propelled mobile technology practices research, and arguably its influence, in new directions since the turn of the new millennium. This includes significant technical developments that have enabled the mobile communications device to become 'smarter', including as a portal for internet access, but also a platform for GPS-based location-based services (LBS). Given mobile

communications devices became internet-accessible, the point of access to digital information from this time on has steadily shifted from the static desktop pc to a mobile device.[1] In Australia, where an estimated 81% of the population own a smartphone,[2] the trend towards mobile internet access has been particularly pronounced. The Australian Bureau of Statistics (ABS) June 2014 Internet Activity Statement reported that not only had Internet downloads increased tenfold since 2009, but also, that mobile digital technologies had become "the most prevalent internet technology in Australia, accounting for half of all connections" (ABS 2014, p. 7).

In addition to enabling internet access through mobile communications devices, the technical developments of the internet itself have re-shaped the nature of information production, supply, and exchange. With the release of Web 2.0 in the early-mid 2000s, otherwise known as the interactive web, the nature of online platforms, web-based sites and interfaces became dynamic and interactive. Significantly, this shift from static digital content (information) to dynamic, changeable, and thus, interactive content, is associated with the beginnings of a so-called culture of participation and customisation. The notion of a 'participatory culture' (Jenkins 2006; Jenkins et al. 2013) represents a substantial shift from the passive consumption of information through the media mediums of print, television and early internet platforms, to a more active culture of participation through a host of Web 2.0 applications. From this time on internet-users have been afforded increased 'participatory' potential in the production, dissemination, and exchange of user-generated digital content, otherwise known as 'new media'.

With the extended functions of the mobile device—from primarily person-to-person communication to wide-scale information access—its uses and relationship to everyday practices has significantly expanded, and, are arguably far less subtle. As Simon Kemp writes "…it's clear that much of our digital behaviour is now converging around mobile devices" (2015). Initial studies of mobile communications focused on the way such

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[1] "Smartphone now most popular way to browse internet – Ofcom report" *The Guardian* 6 August 2015 https://www.theguardian.com/technology/2015/aug/06/smartphones-most-popular-way-to-browse-internet-ofcom Last viewed October 2016.
"More people are using just their phones to access the Internet than desktops" *Business Insider* 1 May 2015 http://www.businessinsider.com.au/mobile-internet-users-pass-desktop-users-2015-4?r=US&IR=T Accessed October 2016
According to Google, since mid 2015, more Internet searches have been undertaken on mobile devices—defined as screens that are less than six inches in size—than from desktop computers (Zakrzewski 2015).
[2] Digital Australia: State of the Nation 2015–16: EY Sweeney

practices contributed to the re-configuration of social organisation and social practices, yet with the advent of mobile computing and digital information access while on-the-go, the physical context of use has become a far more significant subject of consideration. As Dourish states, the reasons for this are straightforward "when computation is moved "off the desktop," then we suddenly need to keep track of where it has gone" (2004, pp. 19-20). While the context of computing has extended from the PC-era of a human-computer relationship, to multiple mobile devices being interacted with over a potentially vast geographical space, Dourish (2006) has argued that this does not constitute an extended disciplinary focus. This represents a significant conceptual point of difference from the built environment disciplines, as in HCI 'context' refers to the space of interaction between information technology and collective practice, wherever that might take *place*.

6.2 From anywhere to somewhere: Location-awareness

The location-aware features of the smartphone allow the mobile device, and thus the mobile device user to be dynamically locatable. While location-awareness is a technical capacity or feature of a smartphone, it can also be understood as user-generated, that is, as a person with a mobile device moves their GPS position is continually sensed, recalibrated, and updated. If the smartphone is running applications that are location-based, they user may receive and/or generate information that is location-specific, or is geo-tagged with GPS coordinates. Location-awareness for smartphones is the result of various technical developments including more sophisticated global positioning system (GPS) technology and software applications designed to interface with geo-locational data, otherwise known as location-based services (LBS). In this way, location-awareness has literally, conceptually, and discursively, brought the spheres of technology, people, and place together in new ways.

While GPS has been a feature of mobile phones for some time, the networking capabilities afforded by Web 2.0 platforms since the mid 2000s has facilitated a greater range of functionality. With more sophisticated GPS technology, the detection, tracking, and sensing capabilities of mobile devices, and thereby the user's location in geographical space, have become far more accurate. These technical developments, coupled with a growing participatory culture of user-generated content, has meant that

mobile applications (apps) such as LBS, location-based social networking (LBSN), and location-based games (LBGs) that were once the purview of niche group of technologically savvy artists and experimenters have become big business and are now considered to be mainstream.

One implication of the growing popularity of location-aware features and services, its shift into the mainstream and hence everydayness, is the attention directed towards matters of location, and in short, urban public space. Location-aware features together with the culture of participation have seemingly bred a fetishism of urban public space. In the post-smartphone era, scholars continue to argue that mobile technology practices are significantly impacting urban public space, yet and in what appears to be a literal interpretation of 'location-awareness', many claim that the variety of ways that location-awareness is practiced *through* a mobile computing constitutes the renewed attention to, and more *meaningful* engagement with, physical-geographical locations or places. For scholars such as Bassoli et al. (2007), de Souza e Silva (2012), de Souza Silva & Frith (2012), Farman (2012a; 2012b), Humphreys (2010), Humphreys & Liao (2013, 2011), Liao and Humphreys (2015), Tebeau (2013), and Picon (2015), location-awareness extends a new and 'transformative' influence over the relationships between information, people, and place.

In a number of empirical case studies and theorisations the concept of location-awareness is central to claims that mobile technologies practices are transforming urban public space. While this discourse places less emphasis on the cultural significance of mobile technology practices and its legitimacy as a subject of inquiry—given this was well established in pre-smart discourse—the pejorative sentiments commonly associated with the early era of the internet, electronic media and mobile communications, as referred to in chapter 5, are far less evident in recent accounts of mobile technology practices and mobile media (Wilken 2008). Instead, a popular view holds that the purpose of mobile location-aware technology practices is to affect an enhancement of people's "negotiation and engagement with space and place" (Wilken 2008, p.39). This view effortlessly glosses over the drivers of location-awareness and LBS, particularly its many earlier applications as critically-oriented art-based practices, and more recently, its significant economic investment and monetisation. To borrow

from John Urry (1995), this thesis argues that mobile location-awareness, LBS and locative-media can be alternately cast as new tools for consuming places.

6.3 Location-awareness and smart-er places

A new polemic of 'smartness' has more recently recast thinking around the role digital technologies might play in shaping the future of contemporary cities. Globally advanced by governments and businesses alike, smart city policies and perspectives feature a strong focus towards capitalising on mobile network infrastructures and services, particularly from a data-gathering perspective. LBS and locative media can be contextualised within this more recent and larger-scale conceptualisation of the smart city paradigm, yet they are equally explored by a vast number of scholars at the finer-scale of human and social interaction and in relation to questions of meaning-making. LBS-led mobile technology practices are argued to help make cities and places 'smarter' through modes of digital informational augmentation. Many scholars further argue that LBS-led mobile technology practices not only impact how people make decisions about where to go and how to move in cities (navigation), but they also affect a radical transformation in the perception, and thus symbolic place-meanings of the built environment.

Using LBS on a mobile device makes it possible for the user—and possibly others—to geographically locate themselves in urban space, to access context-specific information, to locate 'sense-able' people nearby, and to contribute and share information with others. Resultantly, there is a large amount of data produced about people's movements and locations, and perceptions. With forms of user-generated data produced in larger quantities and at greater speeds, the corollary becomes a need for filtering and curative mechanisms. Thus, LBS provide consumable information, as well as platforms for producing, disseminating and interacting with information, while locative media refers to the outputs and inputs of the location-aware enterprise, and to the "…use of information, data, sounds, and images about a location" (Goggin and Wilken 2015, pp.1-2).

Location-awareness has been popularly represented as an opportunity to make people's lives "more convenient, more pleasant, more efficient and more agreeable" (de Waal 2014, p.8). The utility of location-awareness is described de Souza e Silva (2012) as the

provision of "useful services, such as navigation, locating the nearest gas station, locating a nearby friend, and calling a cab in the vicinity" (p.117). In this sense, the inherent logic of "everywareness" (Greenfield 2006) is superseded by a new logic of personalisation, and of understanding individual users in specific contexts to facilitate situational or location-awareness through mobile computing. Yet, given as the term suggests, location-awareness implies an understanding of locality derived *through* mobile technology practices, various scholars assert that this represents a profound capacity to shift perceptions of space and place (de Souza e Silva 2012, p. 118; Wilken 2008, Wilken and Goggin 2015).

Against earlier critiques in both popular media and academic publications alike that connected mobile device use with decreased situational awareness and/or social and physical disconnectedness (Wellman 2002; Gergen 2002; Turkle 2008, 2011), scholars now advance the position that LBS-led mobile technology practices will transform the very processes of interpretation, meaning-making, and subsequently the formation of value-attachments to the built environment. More generally, this narrative is underscored by sensationalist promises that location-awareness will 'return' people's attention and interest to physical-material conditions at a local scale. This is epitomised by statements such as "mobile technologies have reinvigorated our fascination with location and place" (Farman 2012a, p. 18), and particularly, that mobile locative-media allow for a "renewed perspective on space" (2012a, p.74).

More specifically, in ways that reflect disciplinary leanings, scholars lend emphasis to various elements in the process of location-awareness. For example, Farman (2012a), de Souza e Silva and Firth (2012), de Souza e Silva and Sheller (2015) each centralise the mobile 'interface'. Echoing the self-avowed technological determinist Marshall McLuhan, Farman (2012a) argues that it is the medium of the mobile interface that transforms the content, and thus the meaning of the user's location (p.43). By contrast, Rowan Wilken argues that "how we understand and engage with place is…transformed by mobile *media*" (2008, p.40). Similarly, Lev Manovich (2014) is chiefly concerned with the meta-medium of the digital computer—new media—and has more recently examined the cultural impacts of geo-spatial media produced through applications such as *Instragram*. Still others identify key protagonists as those that precede location-

awareness, including the writing of computer code (Thrift and French 2002; Thrift 2004; Forlano 2008; Kitchin and Dodge 2011; Manovich 2013).

Under the overarching theme of place-based digital media information production and access, also more recently described as "digital place-making" (Lottare 2011)[3] and the "Internet of Places" (Morandi, Rolando & Di Vita 2016) the transformative narrative of location-awareness, LBS, locative-media and location-based gaming, is told through several key sub-themes including, movement and navigation (Willis 2008a, 2010; Willis and Geelhaar 2009; Vernhoeff 2012), social organisation, interaction and behaviour (de Souza e Silva 2006, 2012; de Souza e Silva & Frith 2012; Forlano 2008; Galloway 2013; Galloway & Ward 2006; Hatuka and Toch 2014; Humphreys 2008; Humphreys and Liao 2011, 2013, 2015; Willis 2012; Willis et al. 2010b), politics and citizen engagement (Foth 2008, Foth et al., 2011, Foth et al 2013; Gergen 2011), as well as the construction of meaning, historically and ontologically (Ito 2003; de Souza e Silva and Frith 2012; Farman 2012; Tebeau 2013). In this way, the categories of transformation as described in relation to mobile communications practices in chapter 5—Encountering (social organisation), Negotiating (time), and Appropriating (space)—are extended into the perhaps less empirically-provable realm of experience, and towards questions of meaning and cultural production. Thus, the role of mobile technology practices in urban public space and its appropriation is re-cast as a question of meaning-making.

For scholars such as Willis et al. (2010b) sharing place-based information—in the context of LBSN—can transform sites from merely informational, to those that "gain meaning through social exchange" (p.303). Gergen (2010) refers to mobile technology practices as inciting "transformations in communal life" resulting in a new "floating world" of restored communality (p.15), while others give greater focus to the personal experience and sensorial implications of interacting with digital information and mobile digital information interfaces (Farman 2012; Hatuka and Toch 2014). Farman asserts that the "attachment of information and place can *transform* urban environments by altering the capabilities that information has over the city" (2012, p.5, my emphasis).

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[3] Digital placemaking was the theme of the 2016 Media Architecture Biennale http://newsroom.unsw.edu.au/news/art-Architecture-design/digital-placemaking-heart-designing-smart-cities

More specifically, de Souza e Silva and Frith (2012) claim that the read/write ability of mobile technology practices "[l]ocations will become increasingly meaningful, as more and more people are able to annotate them and retrieve location-specific information and therefore actively contribute to the construction of the informational landscape" (p.198).

6.4 From location-aware to location-focused

Questions of location and location-awareness have become increasingly central to understanding, and moreover theorising, contemporary engagements with the internet and mobile media (Wilken 2008; Wilken 2012). Wilken describes this as a return to questions of place, a "reinvestment" in the concept of place, but also its reworking in light of contemporary mobile technology practices (2008, p.40). Conceptually, dynamic and real-time location-awareness that is practised through mobile computing also constitutes a significant divergence from the earlier technourban imaginary of ubicomp (Galloway 2008; Farman 2012). Where ubicomp had envisioned the distribution of computing into various things, environments, and daily life in general, it did not anticipate the convergence of those many things into a singular, mobile, and personal computing device such as the smartphone. With this, as Galloway notes, "[c]ontrary to the discursive construction of pervasive computing as 'everywhere', urban computing and locative media projects [now] expect to locate these technologies 'somewhere'" (2008, p.1).

That, in the context of mobile technology practices, location now matters, is a position that the concept of "net locality", coined by media communications scholars Eric Gordon and Adriana de Souza e Silva (2011) strongly advances. They argue that the advent of mobile location aware technologies is taken as key evidence that the web has merged with physical space, and that this is "transforming our everyday interactions with the world and each other" (2011, p.4). Net locality makes multiple claims on behalf of mobile location awareness, namely that the street is no longer *limited* by a person's individual knowledge (as they are presumed to have constant and unfettered access to a vast digital information space), that small towns can escape their geographically prescribed parochialism (as digital information about the rest of the world can be accessed from its streets), and that geography itself is reorganised and

made more fluid. For the individual mobile location awareness is described as not only useful and convenient, but also a significant way for people to "personalize and control their experiences of physical space" (p.11). Furthermore "location aware technologies and practices transform how people become aware of their location" (p.12) and fundamentally change what it "means to be local in a globalizing world" (p.2). Net locality gives little attention to exploring the contingency of location awareness, that is, its ultimate dependence on the functioning of not one form of technology, but rather a vast digital ecology. Instead, it is vaguely reasoned that as society has created the need for such technologies that they will thereby work.

Following these accounts, the notion of location is theorised as no longer simply pertaining to its physical geography—as if that was ever all it was—but rather its social connectivity and thus relationality. This view grants emphasis to how the mobile interface locates users simultaneously in a networked space that potentially connects them to distantly-located others as well as a vast digital informational space, while remaining physically grounded in, and purportedly equally attentive to, local spaces. Yet, the question of locational attention and/or distraction is not so easily reasoned. Willis (2016) for example describes the networking implications of a mobile smart device as those that "change our relationship with the material, built and tangible world…When you're online, you are less grounded in the material place that you are in" (p.1-2).

With location-aware features and LBS, the mobile 'smart' device is newly represented as the interface to an infinite and unrestricted digital information space about the urban and built environment (de Souza e Silva and Frith 2012; Farman 2012a). When overlaid onto the existing physical world, it variously promised to augment, enrich, or enhance existing urban public spaces. More specifically, de Souza e Silva claims that global networking as enabled through mobile technology practices "strengthens local connections" (2013, p.118). Carlo Ratti and Matthew Claudel emotively describe the overlay of digital networked information on urban space as "…a digital blanket that connects people, objects and events, enabling a vibrant and unprecedented understanding of patterns and flows – the signature of humanity" (2014, p. 89). But, how do mobile technology practices of locative-awareness allow users to forge stronger and more meaningful connections to urban space?

6.5 Mobilising information: Taking it to the streets

While, more generally, mobile technology practices contribute to the movement of digital information in larger quantities and at greater speeds, the corollary of this has been the need for mechanisms to filter and curate this vast quantity of data and information. In this sense, de Souza e Silva & Frith (2012) describe mobile technology practices as the "new interfaces" to public spaces, and those that assist people to "control and manage their interactions with their surroundings" (p.14). Improvements in GPS capability, and developments in mobile computing applications (apps) that integrate LBS, grant the mobile device user access to increased levels of 'located-awareness' in terms of their own geospatial position, and potentially that of others. Additionally, certain apps allow access to, but also the production of, digital information and media content relative to a smart device's geographically identified location. The term 'locative media' commonly refers to these forms of information and media that can be virtually 'tied' or 'tagged' to a specific geographic location in urban space.

Locative media is also described by Tarkka (2010) as a "loose common nominator for artists, developers and activists who explore the possibilities of mobile, location-based, and other pervasive technologies" (p.133). Zeffiro (2010) points out that experimentation in this field has only recently emerged from an "insular milieu" of niche interest groups and, as such, "continues to be redefined and reproduced across varying social groups and institutions" (p. 250). Yet LBSs and locative-media now figure significantly in the commercial realm of mobile application development and has become an everyday feature available to the mobile device user. The scope of projects across institutional, educational, and arts-based sectors that have leveraged the mobility of technology and LBS are, to date, extensive. Coupled with this is a growing vocabulary that variously describes such services and projects as "urban computing and locative media" (Galloway 2006; 2008; 2013); "GPS enabled mobile narratives" (Raley 2010: 312); "mobile location-based media"; "location-based story-telling" (Paul 2013), "transmedia story-telling" (Jenkins 2003), "mobile stories", "locative narratives" and "information landscapes" (Farman 2012a; 2012b; 2013). Broadly speaking, each of these descriptors can imply a service or project that combines fictional, semi-fictional, factual, recent and historical content. To draw a distinction between these variations,

this thesis adopts the phrase 'mobile interpretive projects' as those that draw more explicitly on historic places and events.

Over the previous decade, locative-media and LBS have been widely explored by artists and researchers alike, and featured in multiple surveys such as those undertaken by Buschauer and Willis (2013), de Souza e Silva and Frith (2012); Bilandzic and Foth (2012), Galloway and Ward (2006), Tuters and Varnelis (2006), Galloway (2008), Crow et al. (2010), Zeffiro (2012) and Wilken and Goggin (2015) to name a few. Locative-media research has explored several themes, including the ways location-awareness—as practiced through LBS accessed through mobile smart devices—impact the user's choices (social and physical), and perceptions and experiences of place (Hatuka and Toch 2014). A great deal of scholarship has equally focused on location-based mobile games (LBGs), as for example de Souza e Silva and Sutko's publication *Digital Cityscapes: Merging Digital and Urban Playspaces* (2009). Early examples of LBGs designed for 3G network phones and discussed in academic research include *Botfighters* (Licoppe and Inada 2006), *Battlemachine, Can You See me Now* (Benford et al. 2003, 2006)[4], *Hide and Seek* (Giles et al 2007; Willis et al. 2010b), *Mogi* (de Souza e Silva 2006; Licoppe and Inada 2008, 2010), *Alien Revolt* (Licoppe and Inada 2006; de Souza e Silva 2008) and *Uncle Roy all Around You* (Galloway and Ward 2006). The most recent and prominent example of a LBG discussed in the context of its ability to transform urban public space includes *Pokémon Go* released in July 2016.[5]

A number of studies have also explored the 'spatialisation' of location-awareness through studies on people's use of popular LBSNs that feature game elements and/or modes of geo-tagging incentivisation. Key studies include those that explored several early LBSNs such as *Dodgeball*[6] (Humphrey 2008; 2010), *Socialight* (Humphreys and Liao 2011) and *Foursquare*[7] (Frith 2012, 2013; Gazzard 2011; Humphreys and Liao 2013; Schwartz 2015; Willis 2016). Still others have explored mobile interpretive

[4] http://leoalmanac.org/journal/vol_14/lea_v14_n03-04/roy.asp
[5] https://www.theguardian.com/cities/2016/jul/22/urban-gamification-Pokémon-go-transform-public-spaces Accessed October 2010.
[6] *Dodgeball* was a free mobile phone-based service operating between 2000-2009, available in USA cities via smartphone devices. It was acquired by Google in 2005 and integrated with Google Maps.
[7] Foursquare is a location-based social network application. This application is 'objective-based' or competitive in that points or badges are offered as rewards for 'checking-in' to locations.

projects such as *Urban Tapestries*[8]*, Street Museum*[9] (Farman 2012a, 2012b), *Hide and Seek* (Willis et al 2010), *that way app* (Willis et al., 2012), the *Fort Vancouver Mobile Project* (Vogt 2012; Oppegaard & Grigar 2013), the *Cleveland Historical Project* (Tebeau 2013), and mobile interpretive projects that use the augmented reality (AR) app *Layar* (Gardner and Harfield 2014; Liao and Humphreys 2015).

6.6 Location-based services, games, and media

Mobile location-aware practices are argued to be critically different from earlier mobile technology practices and mobile media, particularly with respect to the relationships forged between the individual user and urban public space. Mobile location-aware technologies reach into and draw directly from the conditions of urban public space and in this way are highly contingent on urban public space. Research has empirically examined early and popular examples of LBSN that feature both social and game elements including *Dodgeball*, *Loopt, Foursquare,* and *Socialight*, to name a few. A key theme of this research concerns how the affordance of visualising the locations of friends or registered users of the applications, as well as having access to their locational 'tips', can contribute to reconfiguring socio-organisational practices, that is, the ways users subsequently navigate and inhabit urban public spaces (Willis and Geelhaar 2009; Frith 2013). Yet many of these studies further claim that socially shared information through LBS, or user-generated mobile media, motivates users to explore and discover urban public spaces in ways that transform their perception and understanding of those spaces (Humphreys and Liao 2011; Gazzard 2011; Frith 2013; Buschauer and Willis 2013; Willis 2015; Schwartz 2015). In short, mobile technology practices such as these are argued to influence the meanings and perceptions of urban public spaces (de Souza e Silva and Frith 2012, p.51).

Given the large body of speculation and critique connected to early mICTs, including claims that mobile communications and mobile media would compromise social capital, situational awareness and place-attachment, many contemporary scholars of locative-media have framed their findings in the manner of a counter-argument. Researchers have drawn from both observational and interview-based research of specific LBSs to

[8] http://research.urbantapestries.net
[9] http://www.museumoflondon.org.uk/Resources/app/you-are-here-app/home.html

theorise significant shifts in the user's perception of urban space from a 'background' to a 'foreground' consideration. While location-based games such as the more recent *Pokémon Go* encourage users to discover and collect digital or virtual objects, LBS applications such as *Foursquare*, *Dodgeball*, and *Socialight* are those that more specifically leverage the conditions of the real-physical built environment as locations or places to be discovered, and 'collected'. In this way, while *Pokémon Go* is location-based it is not necessarily location-focused.

More generally, Gordon and de Souza e Silva (2011; 2012) describe "net localities" as the hybridised production of space brought about when networked publics are brought into physical spaces through mobile and location-aware technology use. Net locality refers to the connections between locally situated people and global social and informational networks. They argue that net localities represent a positive transformation of space that opposes "all those who decry the effects of technology on public space" (p.100). More specifically, they offer deterministic speculations on the power of mobile and location-aware technologies to enhance urban public space by expanding its purview through socially shared information to make it "more useable" (p.100). Similarly, Buschauer and Willis (2013) coin the phrase 'mediated localities' to describe the layering of locative-media over an existing place. Mediated localities are argued to constitute a "revaluation of place", and resultantly a "shift in [the] significance of location" (Buschauer and Willis 2013, p.28).

A range of other researchers have also described how mobile location-aware practices enable urban public spaces to become "more visible" (Licoppe and Inada 2010) through the various ways they incentivise people to explore, discover and communicate information about urban places (Humphreys & Liao 2011; Schwartz 2014). Under the larger theme of participatory practices, de Souza e Silva and Frith (2012), argue that as LBS allows users to digitally attach user-generated information to place, this enables users to 'read/write' urban public spaces, and in this way, to produce urban public spaces. Given the opportunity to annotate, document, and reflect on the conditions of their own situated environment, the user is argued to attain great control over their own environments through the mobile interface more generally and the practices associated with LBS more specifically.

On the transformation of the perception of spaces, and drawing on an empirical study of *Foursquare* users, researchers such as Gazzard (2011) and Willis (2015) have each argued that mobile and location-aware practices can elevate the status of in-between spaces—those less defined by conventional categorisation in a spatial, temporal, but also conceptual sense—such as transit spaces. The reasoning for this follows that as the application requires users to check-in to locations, firstly they become more aware of their movement *between* more commonly accepted and most likely named 'destination' spaces. Secondly as in-between or transit spaces tend to offer the opportunity to dwell-in and engage with the application, by virtue of this such locations are regularly checked-in to and acquire more 'visibility' through the application. Thirdly, as Schwartz (2015) discusses in a more recent study, the game mechanics of *Foursquare* allows users to contribute and name their own 'venues' to the application's locations database. Drawing on Low and Altman's (1992) theory of "place attachment", Schwartz theorises that place-naming is a practice that builds a sense of place-attachment for *Foursquare* users, and LBS users alike.

In calling into question how LBSs might constitute new or renewed interest in locations within the built environment, Gazzard's (2011) earlier study of *Foursquare* points to how the mechanics of incentivisation compel users to check-in to as many locations as possible to earn rewards. Thus, rather than discovery this suggests that such applications encourage a 'stalking' of the built and urban environment in ways that can often be directly at odds with the discovery and awareness of urban spaces. Furthermore, pursuing locations to seek rewards are practices that do not necessarily equate to any greater awareness or understanding of meanings of the built environment. Likewise, Schwartz (2015) concedes that documenting our relationship to places through online methods and LBS is not an inherently new practice, but rather represents a significant shift in the scale of such practices, and thus in the accumulative sense represents a new form of "collective attachment" (p.96).

In their theorisation of mobilised lives Elliot and Urry (2010) suggest not that meanings of places as individually experienced through mediated forms of mobile technologies practices might be enhanced, but rather that mobile media allows individual interpretations of meanings to become encoded in techno-objects. In such a way, "the use of various miniaturized mobilities engage people to deposit affects, moods,

dispositions into techno-objects – storing such emotional and aesthetic aspects of self-experience until they are 'withdrawn' for future forms of symbolic elaboration and interpersonal communication" (p.6). This means that even though mobile technology practices are attention-demanding in ways that can draw focus away from the location, the nature of mobile lives (where mobile media is produced and accessible) allows the experience, meaning and its affect to be asynchronous, deferred, and potentially relived multiple times.

However, many accounts centralise the role of information sharing within a digital social network over discussions of individualised experience as significantly transformational. According to Buschauer and Willis (2013) participating in LBSN applications and contributing information about locations collectively initiates a "recoding of place, moving from map-based and abstract to social and networked" (2013, p.33). While this may be true for many applications, it is worth noting that the situated interaction with LBS through the mobile interface remains a fundamentally individual experience, yet one that is not adequately described as a 'private' experience. So it follows, as de Souza e Silva and Frith (2012) note, that "mobile technology use[s] in public spaces complicate traditional understandings of what it means to be in public, allowing people to bring previously private activities (reading, listening to music) into public spaces" (p.51).

The ways specific mobile technology practices can complicate the public/private dichotomy is also addressed by Humphreys (2010) in her examination of the social impacts of the location-based social networking game *Dodgeball.* Humphreys applies Lofland's (1973, 1989, 1998) urban social-spatial definitions as discussed in chapter 3, to theorise how the social exchange of information within the *Dodgeball* network builds familiarity of locations and thus catalyses a transformation of public space from a 'public realm' to a 'parochial realm' for the user. Subsequent to Humphreys' noteworthy LBS research, and in ways similar to notions of locational 'familiarity', scholars have increasingly pointed to how interacting with locative-media actively constructs locations that are "more visible" and "more personalised", and thereby, "increasingly meaningful" (de Souza e Silva & Frith 2012, pp.197-198).

Various rhetorical themes can be gleaned from surveying the range of mobile location-aware practices research, including that they enable a more personalised experience: information tailored to the user's preferences; a more dynamic experience: on-demand information that is also 'real-time', aggregated, and readily updatable; and a more interactive and participatory experience: the user's ability to contribute and share information and data (knowingly and unknowingly). In digital media speak the overall experience is thus argued to be 'immersive'. As Brighenti (2012) argues, these assertions are a consistent feature of new media literature that "leans towards techno-enthusiasm" and embraces the ideology of so-called "user empowerment" (p. 400).

6.7 Mobilising history: mobile interpretive projects



Figure 11. Examples of location-aware mobile interpretation apps.

Much LBS research has attributed the transformation of a location's meaning or a transformation in the meaning-making process, to the socio-informational sphere. Yet, location-awareness, as the name suggests, has also brought greater focus to the everyday experiences of the built environment. Moreover, the combination of LBS with Augmented Reality applications (AR)[10] such as the AR browser *Layar*, are argued to provide a "new way of viewing existing spaces" (Gazzard 2011, p. 417). In the context

[10] Augmented reality (AR) here refers to the use of the mobile interface as a means to overlay data and information to "augment real-world spaces with virtual objects or even layered spaces" (Gazzard 2011, p. 411). Manovich (2006) describes AR as a paradigm that has existed since the early 1990s and as "the laying of dynamic and context-specific information over the visual field of a user" (p.222) and one that is opposed to virtual reality (VR) where the user works on a virtual simulation; for AR "the user works on actual things in actual space" (p.224).

of LBGs, AR is often described as a way to de-familiarise the user with the built environment in ways that make it newly strange such that it can then be 'rediscovered' (Keogh 2017). LBS and AR are technologies that have also found popular application in the sphere of mobile interpretive projects. And unlike the aforementioned LBSN examples that are more often theorised in socio-organisational ways, and LBGs such as *Pokémon Go* that are location-based but not necessarily location-focused, mobile interpretive projects centre on narratives and meanings about spaces and places. Given this, in this thesis mobile interpretive projects are considered useful examples to discuss the impacts of mobile technology practices on the perception of the built environment, and to that end, are further explored here with consideration of several case examples.

In terms of urban historical interpretation, the notions of 'locating' information-in-place, and the mobility of information are far from new. Similarly, the power of tying information to (geographical) place, and humanistic understandings of the experience of meaning through place, has been widely discussed by a host of scholars, notably Relph (1976), Casey (1997), Malpas (1999), and Tuan (1979) who writes "emotion…finds expression and anchorage in things and places" (p. 417). Equally, it can be argued that urban historical interpretation in the form of inscription or fixed-signage, the 'analogue', and mobile forms of printed media or the tour-guide experience, are all media that can 'update' or revise their interpretive content. To update or replace a fixed-sign, or repair or update a software link, could equally be seen as easy or frustratingly arduous tasks, each coming with their respective layers of 'infrastructure'. Arguably forms of participation and socialising are also possible in each of these cases. Finally, the notion of a deeper engagement with place via a mobile interface remains a contentious discussion and one that finds the existing literature favouring a post-phenomenological reading of screen-based interaction in terms of embodiment and sensory inscription (Farman 2012a), over discussions that it constitutes an additional barrier to 'real' experience and interaction (Virilio 1994). The question becomes, what kinds of 'new' meanings can mobile technology practices offer?

Mobile interpretive projects that leverage the smartphone and LBS platforms have built on the foundations of earlier mobile annotation projects such as widely successful [*murmur*] project that operated out of cities such as Toronto, Edinburgh and Melbourne from 2003 (Orpana 2009; Micallef 2010; Farman 2012b; Galloway 2013), and later

Stroll in Toronto (Micallef 2010; Orpana 2009), as well as a number of other notable projects from the pre-smartphone era that ran on gps receivers for geocaching activities (Willis 2010), portable computing devices (PDA) or utilised blue tooth technology such as *Urban Tapestries*,[11] *Moving City* (Hale and Schnädelbach 2009), and the prototype *Story post* (Willis 2008b). These earlier approaches to more personalised modes of mobile interpretation *in situ*, and those that have subsequently adopted LBS, typically reflect ways to visually and conceptually straddle and hybridise past and present times, places, and types of information.

With consideration of the aforementioned scholarship and projects, this chapter presents two case examples of mobile interpretation projects local to the inner-city areas of Sydney, Australia, including the institutionally conceived Powerhouse Museum (PHM) AR *Layar* app, and the mobile-based game *Razorhurst*, developed privately by new-media artist Richard Fox. Initially developed in 2009 using an early version of the pioneering augmented reality platform *Layar*, the PHM app sought to provide mobile screen-based access to historical archival data, namely photographs, relative to the geo-located position and camera view of a user's smart device. The 'map-view' feature of the app situates the smart device user relative to nearby places that are geo-tagged with forms of PHM archival data. When activated the app links to, and searches for, a 'similar view' from the PHM's archival photography databases – including the PHM's Flickr database of places and buildings. Thus, the user can compare their 'real time' situated view [Figure 13.0.] with a screen–based display of a similar view, or range of views, corresponding to their geo-location and as recorded during an earlier time period [Figure 12.0]. In this case, the PHM *layar* app refers more specifically to archival material ranging from the late 1800s to the 1930s.[12] In terms of historical interpretation it is worth noting that while these archival images may potentially relate to places or events regarded as historically significant, likewise they may also be digital archival content that has simply been made accessible.

[11] http://research.urbantapestries.net
[12] The PHM *Layar* app splash screen refers to PHM *Flickr* archival material as ranging from the late 1800s to the 1930s.



Figure 12.0 The Corner of George St and Hay St, Sydney, no known date, between 1900-1909. Source: PHM Flickr commons archive



Figure 13.0 The Corner of George St and Hay St, Sydney, 2013.

The method of geo-located image retrieval and comparative viewing is one that has subsequently been adopted for a number of mobile interpretive projects, including most notably the Museum of London's *Streetmuseum* app. *Streetmuseum* extends the possibilities of interpretation to include a range of features including an on-screen blended overlay of the past and real-time views as for example shown in Figure 14. Discussing this project, Farman (2012a, 2012b) argues that where location-awareness utilises augmented reality to draw from a rich database that this transforms the "user's sense of inplacement…by experiencing a simultaneous layering of space and time, the user is offered a deeper sense of context and meaning for the place that defines their sense of self and body" (2012b, p.20). Yet the retrieval and display of location-specific 'historical' material, to provide an 'I'm here now—this was then approach', are also akin to holding or placing a printed photograph close to the original position and angle of view from which the image was taken.

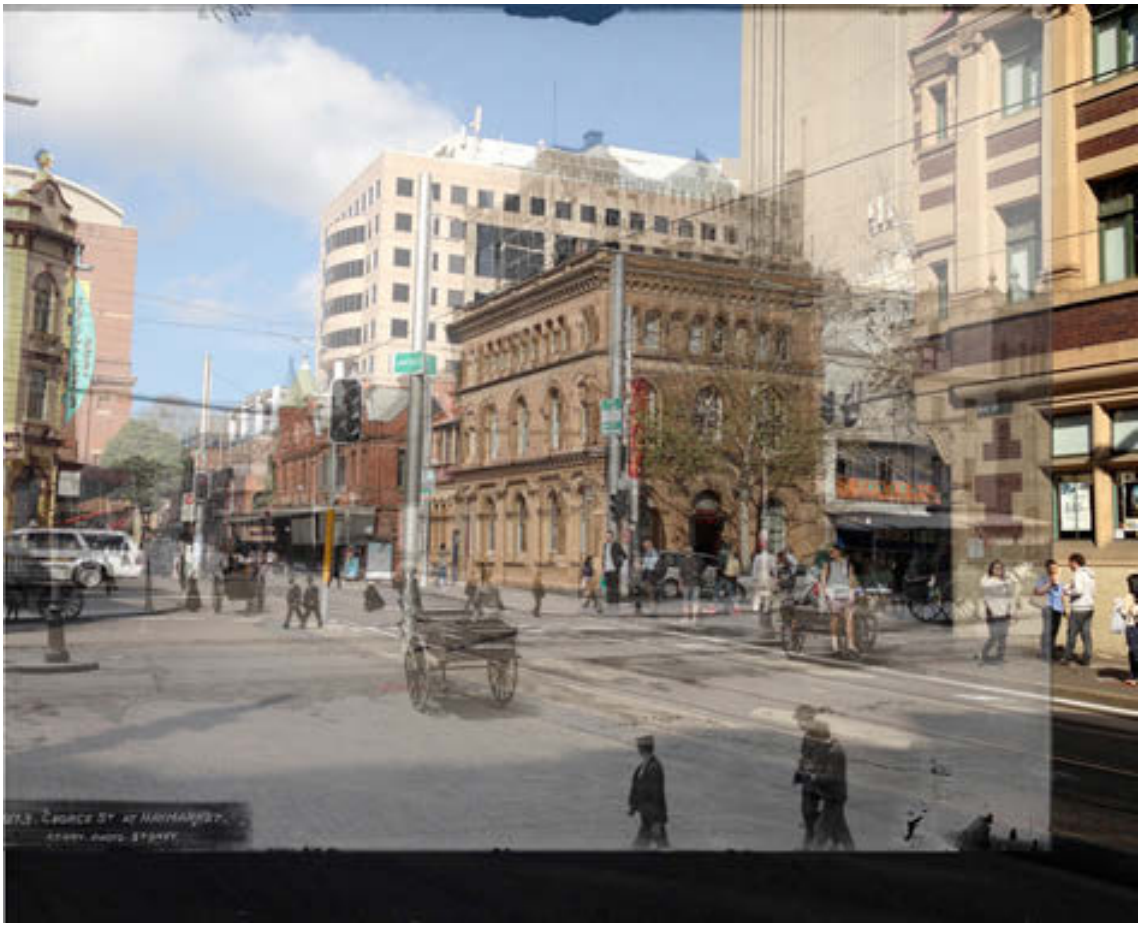

Figure 14.0 A blended overlay of Figure 12.0 and Figure 13.0.

Cultural venues, exhibitions, urban inscriptions, and literary works can and do employ similar visual-temporal blending techniques to construct a layering of interpretive content. The particular advantage for the mobile app user however is the provision of access to a potentially wider range of data through a single medium or interface. As such the limitations of a physical display space are indeed overcome. Nonetheless, the mobile interpretive experience remains contingent in respect of a range of issues namely the existence of location-relevant data, the successful linking of data to the host software, an operable internet connection, the functionality of the mobile device, the software interface usability, and finally the particularly *choices* made by each user.

While mobile interpretative apps such as those aforementioned can alert and guide the user to the proximate locations that are linked to geo-located content, the users remain essentially free to devise her/his own route through the built environment. Ultimately decisions about what to pay attention to concern personal preferences and choices, and while this is certainly a factor in any form of historical interpretation, the mobile

experience suggests that individuals might exert greater control over the construction of their own interpretive framework. More significantly, however, are the ways this personal interpretive framework becomes one that is largely determined by, and contingent on, movement through urban space. Remediated through the mobile interface, urban history may thus be geographically (re)contextualised, although not necessarily understood by the user who may lack a wider relational interpretive context.

Mobile interpretive apps reflect a form of urban history 'on-demand', where information access is potentially instantaneous and experienced 'in-situ', yet also potentially discontinuous and disordered. Viewed in a more positive sense, such interactions constitute new and potentially more iterative and recurrent modes of urban historical interpretation. And this suggests, to paraphrase Nicholas Bourriaud (2002), the possibility to "connect levels of reality" that would otherwise be "kept apart from one another" (p.8).

From the perspective of designing and constructing mobile interpretive projects, Tebeau's (2013) *Cleveland Historical* project in many ways supports Galloway's (2008; 2013) assertion that when viewed through their technological guise such projects are expected to 'extend' and 'transform' urban experience. Tebeau (2013) similarly relates the well-worn trope that connecting information to place will result in "deepening the experience through making contextual meaning" and that "when experienced in situ, [mobile] stories enhance our sensory experience" (p.26, 29). More convincingly, however, his case example points to ways that the mobile interface platform makes possible a "new way of building...history" (p34). This includes the ability to layer multi-media content, including text, images, video and audio, but also the opportunity to curate the project in a broadly collaborative way.

The *Cleveland Historical* project chiefly explores how mobile interpretation can provide ways to re-centralise 'locative-listening', and in this way a key objective is to shift the focus back to oral histories. While this suggests the digitisation of an existing urban historical interpretation practice, Tebeau (2013) argues that the mobile interface not only augments, but also transforms this existing practice to facilitate a continual and "collaborative storytelling process" (p.28). He describes the project as a "community-orientated endeavour" where the key objective is to "build the project collaboratively"

(p.30). It is worth noting here that ultimately the available app content, whether user-generated or otherwise, remains vetted by the app developers, in this case, the Center for Public History + Digital Humanities at the Cleveland State University.

While the *Cleveland Historical* example focuses on relaying many stories from a range of voices, other projects, such as the privately developed *Razorhurst* app, represent a more specific focus, addressing a particular era, place, and set of events in history. Initially described as a "GPS tour" or "GPS adventure/game" (Timeout 2011), *Razorhurst* is a LBG whose foundations are fundamentally historical. The app content is largely based on the publication, *Razor: a true story of slashers, gangsters, prostitutes and sly grog*, written by Larry Writer in 2001 and features multi-media content including archival images, and theatrical video re-enactments. The focus of the content is on the prominent crime-related personalities, and their activities and movements in and around the inner-city suburb of Darlinghurst, Sydney during the 1930s and 1940s.

Users or 'players' of the *Razorhurst* app can assume the persona of a range of historical figures from the *Razorhurst* period, and in doing-so participate in a quasi re-enactment of events. This has in some cases been more actively taken up as evidenced by the group of keen players shown in costume in Figure 14. As various features and content are triggered by geo-locations, users are motivated to move through the suburbs of Darlinghurst and Surry Hills. Equally the app is objective-based requiring users-as-players to collect and deliver virtual stashes of 'sly-grog' to and from various geo-tagged locations while also slaying virtual assailants. In this way the *Razorhurst* app operates as a mode of urban historical interpretation that—literally—'plays' on mobility.



Figure 15.0 *Razorhurst* players in costume, October 2011 at the Republic 2 Courtyard, Palmer Street, Darlinghurst. Source: Richard Fox.

The *Razorhurst* app mobilises history in both its construction and interpretation through a 'place-to-place' activity-based logic, producing an alternate form of collaboration or participatory experience that is performatively based [Figure 15.0]. In this case the historical narrative is not simply 'released' at a corresponding geo-location, but rather it is sought out and constructed by the participant's journey. This is history being simultaneously performed and produced or enacted through tracing and re-tracing past histories as well as establishing new histories through the movement through urban spaces. While this is an incentivising form of game-play, at the time of 'playing' it operates to concurrently communicate and 'interpret' a particularly period of urban history.

> *"The wondrous thing about the hive of suburbs once known as Razorhurst is that today, seventy-odd years later, it requires only a little imagination to mind-travel back to those long-gone wild years" (Writer 2001: xxii)*



Figure 16.0 Playing *Razorhurst* attempting to slay virtual assailants at the corner of Palmer Street and Liverpool Street, Darlinghurst with the former Tradesman's Arms Hotel in the background.

While the geo-locations of *Razorhurst* cover a reasonably extensive area, the expectation/assumption is that this is to be largely experienced on foot. Given that there is no pre-defined order of places, the app can be accessed multiple times in order to visit each geo-location and review the interpretive content. It is argued here that the focus on how people historically behaved and moved between places serves to construct a more relational understanding of the urban historical context and this operates as a spatialisation of history. With examples such as *Razorhurst*, and similar crime-history focused projects including the *Chicago Gangland Tour* app[13], the curatorial process, but also the experiential process, is transformed through relational movement not only between places, but also temporally, between times. The *Chicago Gangland Tour*, for instance, highlights the locations of currently open businesses that were previously linked to the Chicago mob (Mikel 2010).

[13] http://chicagoist.com/2010/04/21/chicago_gang_history_meets_iphone_a.php & https://itunes.apple.com/us/app/chicago-gangland-tour/id365450715?mt=8

'Mobilised' interpretation practices such as these shift the emphasis from 'emplaced' information, to the construction of an informational field; in other words, from historical content (stories) to historical contexts (place) understood through movement. As Turnbull (2002) writes "[s]patial history is…the reconstruction of the narratives of movements and 'dwellings-in', through which knowledge and space are brought into being" (p.133). The medium specificity of the mobile interpretive project then can be regarded as one that is particularly aligned to a performative understanding of history.

For urban historical interpretation, capitalising on the everydayness of mobile technology practices has had a range of implications. Within institutional settings this has led to a suite of new curatorial approaches, practices, and services such as those described by Tebeau (2013) and evidenced by the digital tools now offered to the public at a range of prominent cultural institutions globally. The *Affective Digital Histories*[14] project for Leicester in the United Kingdom for example promotes their smartphone applications *Hidden Stories* and *Sounds of the Cultural Quarter* as technology-driven immersive experiences that can 'unlock' and 'uncover' a range of hidden historical content. With greater sophistication and accuracy of GPS software, and a strong familiarity of apps and ease of user for mobile users, mobile interpretation projects and applications are now common institutional and government initiatives.[15]

Outside of institutional settings, mobile digital tools have similarly allowed a range of people and groups to experiment with and produce their own 'do-it-yourself' mobile interpretative projects that can also be made available to a broader public. In this way, the adoption of a range of digital tools, within and outside of institutional settings, has contributing to 'mobilising' historical interpretation and disrupted established author/expert-audience roles and relationships. While we may read these new 'public authoring' practices and the participatory annotation of urban space as a resistance to the threat of totalising narratives, historical or otherwise, can the pluralism of multiple voices adversely affect our interpretation, such that no stories can really be fully developed, heard or understood? What is potentially lost through mobile technology practices? In what ways do mobile technology practices threaten to flatten and devalue historical interpretive practice?

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[14] http://affectivedigitalhistories.org.uk/apps Last viewed 28 November 2014
[15] http://www.sydneyculturewalksapp.com Last viewed 7 November 2016.

In an emergent competitive informational landscape, as mobile interpretive projects both interpret, but also produce histories, it would seem that the task of curating urban histories is not diminished, but rather ever more significant. Whether in-situ or mediated through a smart device, the question of how and where historical information is (geo)located and thereby typically accessed remains a significant question. Some stories, as Tebeau (2013) points out, "transcend locations"; still others concern places or buildings that no longer exist (p.30). Further, he asks, on what basis do we geo-locate certain stories and not others? These decisions are not necessary determined by the medium, but are often contingent on the vested interests of the institutional, education, or private auteurs developing them. In other words, histories will continue to be 'selective', and in some cases, again as Tebeau (2013) notes, this can result in the elevation of some over others potentially based on their popular or commercial appeal (p.27). Significantly, this contingency also extends to the do-it-yourself mode of urban historical interpretation, as public voices also come "each with their own intellectual and aesthetic baggage, moods, knowledge, and expectations" (Bal 2006, p. 525). In effect this reaffirms the tendency for any form of historical interpretation, regardless of its medium-specificity, to both reveal and erase.

Whether discussing LBSN applications, LBGs, or mobile interpretive projects, each of these mobile technology practices reflect a repositioning of the individual as a significant agent of interpretation. Reflecting on an early example of taking an architectural exhibition 'into the streets' by using an AR platform on a hand-held computer, Jonathon Hale and Holger Schnädelbach (2009) describe an increasing shift towards mode of 'personal interpretation'. In the institutional sense this is addressed in the popular adoption and subsequent focus towards 'public authoring' and participatory practices that have been made easier with Web 2.0 developments and personal mobile computing. This recalls Manovich's (2013) discussion on the "aestheticization of [informational] interfaces" and the conceptualisation of (mobile device) interaction as a meaningful experience (p.312-315). This also echoes what Jenkins (2001) earlier foretold as the impending culture of "information hunters and gatherers" who expect information to be instantaneous—on-demand, dynamic, updatable and, in effect, iterative (p.1).

Participatory modes of interpretation through a host of mobile technology practices address a growing trend for individuals to record, re-tell, and re-distribute their everyday experiences as micro-(hi)stories of the city. We might say that the historical narrative has shifted back into the everyday in ways that reassert the value of active human experience to the process of interpretation. In light of these factors the notion of historical interpretation can be considered extensible, with new and divergent insights on offer from a range of un-affiliated sources. Seen in one way, LBS, LBSN, locative-media, and mobile interpretive projects, in both the official/institutional and everyday/personal sense, collectively represent a renewed emphasis on the corporeal moving body as the "affective vehicle" for interpretation (Sheller & Urry 2006, p. 216).

6.8 Mobilising expectations: The future is yours to locate

Commentators have recently argued that the *Pokémon Go* phenomena, that reached fever-pitch in mid-2016, demonstrates in exemplary ways how LBGs and AR features can heighten the appreciation of urban public space, built environment landmarks, and historical features (Lynch 2016). Yet, as is argued here, while LBGs might be location-aware and are highly contingent on and attentive to the conditions of the built environment, this does necessarily make them location-focused. Unlike more dedicated mobile interpretive projects, or historically-orientated LBGs such as *Razorhust*, the primary incentivisation in examples such as *Pokémon Go* remains the game objective of capturing *virtual* creatures, and this can be at odds with building an awareness of, or renewed discovery of urban public spaces.

Nonetheless, the corollary of engaging in mobile location-aware technology practices, including LBGs, is that they can draw people to urban public space in new ways and for reasons that extend beyond the physical features of the place. This underscores Batty's (2013) view that as what goes on in cities is increasingly virtual, that notions of transformation can thereby be understood as the physical reality of urban public space drawing apart from the activities that define it. With this, speculation on the ways mobile technology practices affect change in long-held understandings of urban public space has grown. One way that *Pokémon Go* highlights this idea is that the landmarks people are drawn to through the game are based on the cumulative data of geo-tagged locations from a previous AR LBG by the same game-designers called *Ingress* (Keogh

2016; Lynch 2016). Like the examples of mobile interpretive projects discussed here that allow users to contribute their own stories of places or events, and examples of LBSN games such as *Socialight* and *Foursquare* that allow uses to geo-tag favourite places, *Pokémon Go* examples a user-generated perspective of place-attachment that can differ from institutional or formal understandings of urban public spaces. Equally in all of these examples the user-generated perspective offers an alternate way to see potential uses of urban public spaces that may be at odds with their intended or designed use. This includes uses of spaces in ways that might be permissible, enjoyable, or on the contrary, verboten.

From Lynch's perspective, that large groups of people are drawn to certain *Pokémon Go* locations serves to reinforce long-standing principles of good urban public design, such as those set-out by William H. Whyte (1980) including an open environment, seating, and accessibility. Yet, he goes on to argue that "unlike traditional plazas, whose development is often dictated by historical or economic motives, the success of a Pokemon space is entirely democratic" (Lynch 2016). The reference to such practices affording an 'entirely democratic' view of an urban public space is rather entirely problematic. When you take into account the often-niche group of people engaged in many mobile technology practices, and particularly LBGs, a wide and diverse representation of views is a significant challenge, if not an impossibility. More broadly, what this points to is that while mobile technology practices afford a host of 'big-data' opportunities from the geo-locational ping of mobile-users, to the more qualitative nature of mobile media that is ripe for 'sentiment analysis', the profile of user-data must be taken into account.

Less discussed are the potentials for mobile technology practices to compromise processes of place-attachment. As the examination of case examples of mobile interpretive projects suggest, while the affordances of the mobile technology practices mean information about place may be experienced *in* place this should not be assumed as a place-attachment *fait accompli.* Having access to more and dynamic information about place does not equate to building place-attachment or an any more meaningful experience of place. The quantity and quality of digital information made available to the user could equally operate to adversely affect their interpretation, and obscure potentially more relevant information. Regardless of the specifics of the mobile

platform in use, information is always filtered and selective in ways that both reveal and erase ‘meanings’. Certain sources of information and not others may be elevated on the basis of popular opinion, and commercial objectives, as well as unduly influenced by an individual’s search history. In this way, the celebrated attribute of mobile technology practices promoting opportunities to personalise space can also work against the user, by reducing the possibility of access to a more diverse spectrum of place-related information and/or stories. This phenomenon is recently described in relation to the constraints placed on civic engagement by algorithmically influenced “filter bubbles” that produce “echo chambers” (Foth et al. 2016). In short, the individual’s world is not expanded but rather mirrored back to them. And in this sense, urban public space is neither made more meaningful nor transformed but rather it is curated.



Figure 17.1 The AR experience and personalised ways of seeing, ‘Ancient’, image 1 of 4.
Source: Student project by Branko Cosic and Ryan Johann.

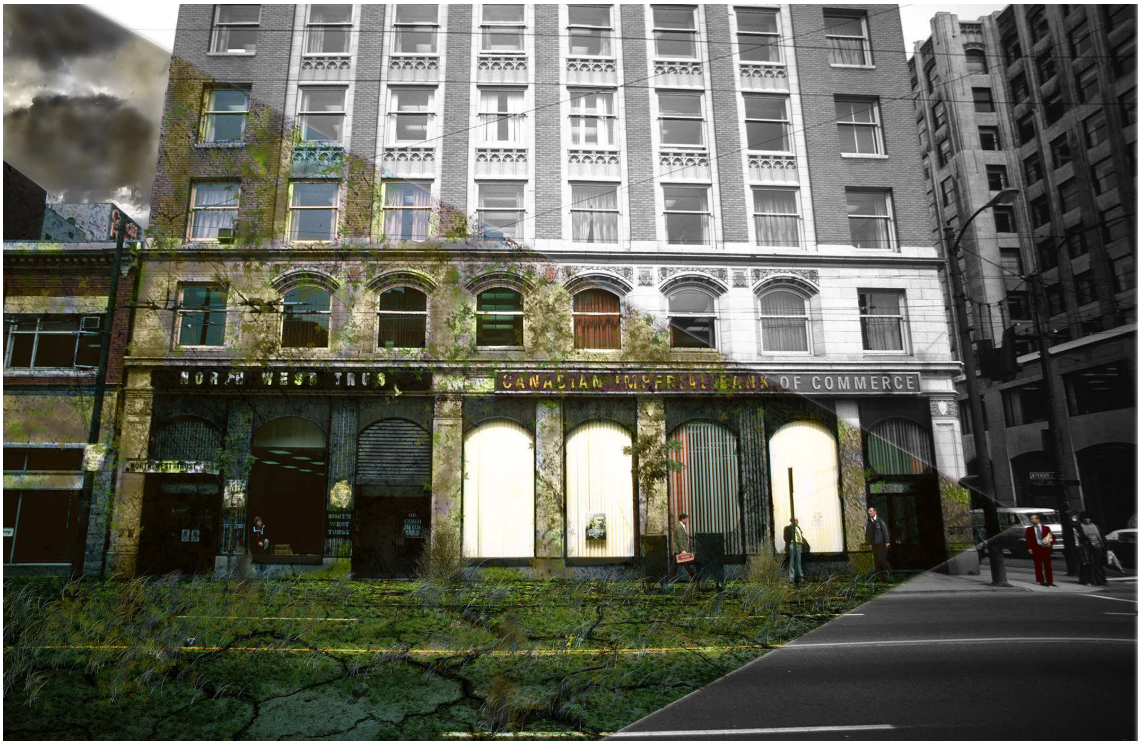

Figure 17.2 The AR experience and personalised ways of seeing, ‘Apocalyptic’, image 2 of 4.
Source: Student project by Branko Cosic and Ryan Johann.



Figure 17.3 The AR experience and personalised ways of seeing, ‘The Future’, image 3 of 4.
Source: Student project by Branko Cosic and Ryan Johann.

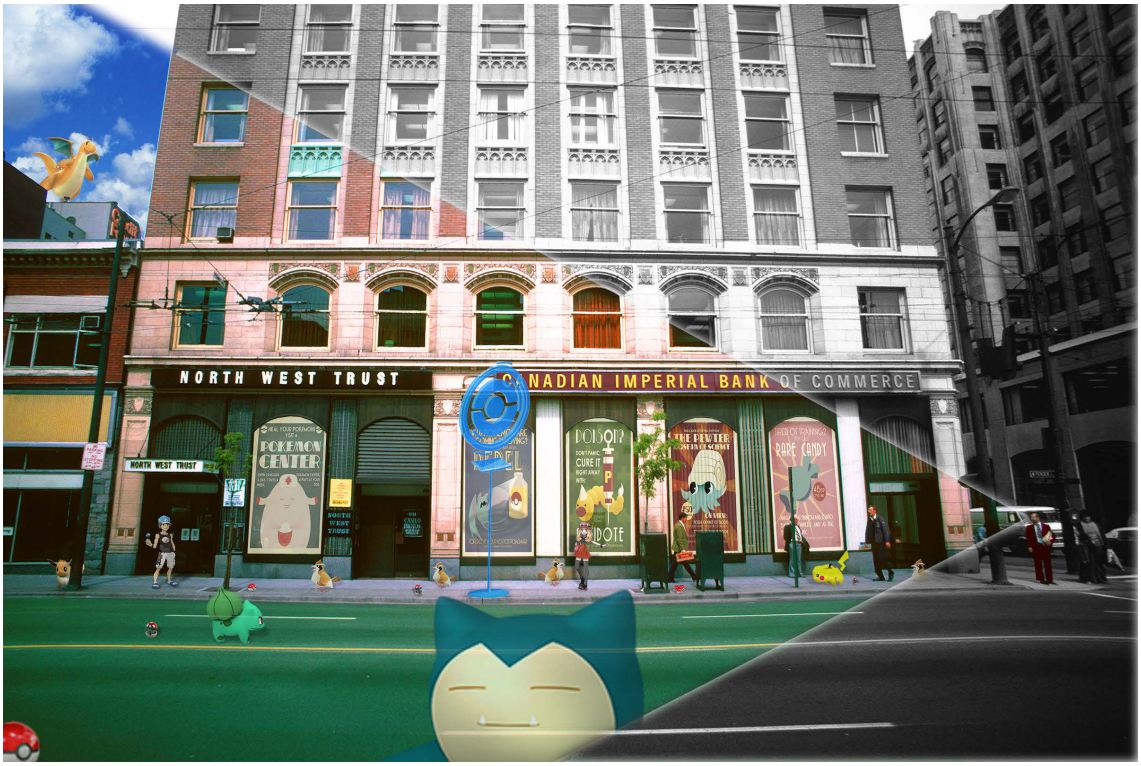

Figure 17.4 The AR experience and personalised ways of seeing, 'Pokémon', image 4 of 4.
Source: Student project by Branko Cosic and Ryan Johann.

Mobile technology practices do contribute to the production of an unprecedented scale of potentially useful and unsolicited information in ways that offer alternatives to more traditional research methods such as participant interviews that more directly solicit information. This may yield valuable insights into actual uses and user-perspectives of urban public space and is an area of research that scholars such as Manovich (2013) are forging ahead with. Yet, despite claims to the pervasiveness and ubiquity of mobile technology practices, it must be acknowledged that the data they produce may equally fail to represent a diverse range of user-groups of any given urban space and/or may accumulate far more voices than is necessary to arrive at useful observations. This last point speaks to the premise of the 'tragedy of the commons'. In this way, what must be more fully considered in these claims to the transformed meanings of urban public space through mobile technology practices, is for whom is this so-called transformation relevant, and moreover, what does this information *not* tell us?

Views such as those of Lynch (2016) reinforce expectations that mobile technology practices can extend, enhance, enrich, or transform the experience of the built environment. Moreover, examples such as this beat the drum of participatory culture

and user-empowerment in ways that suggest mobile technology practices can make urban public space more public. Yet, while on the one hand a range of discourse points to ways that mobile technology practices can make urban public spaces more public through renewed attention to physical locations and participatory practices, others contend that mobile technology practices allow users greater possibility to construct personal spaces, experiences, and critically, to assume greater control and management by interfacing with urban public spaces *through* mobile computing on one's own terms (de Souza e Silva and Frith 2010). This recasts the public and private space dichotomy as private being equal to 'in-control' and public being equal to 'without-control'. Yet, if we are to take Arendtian and Lefebvrian ideas of public space seriously then we must question what the trends towards user-controlled or mass-customised urban public space really provide and for whom? Furthermore, drawing from the discussion of mobile interpretive practices in this chapter, data-mined from mobile technology practices must acknowledge the ways it can privilege certain demographics over others, particularly in terms of access to technology and mobility, but also in terms of the typical profiles of LBG users or users of mobile interpretive apps.

Finally, as Galloway well reminds us, the [great] expectations of mobile technology practices are not neutral, but rather can actively shape the way future tools and practices are designed, understood, and used (2013, p.356). In the manner of a self-fulfilling prophecy, claims about the transformative impact of mobile technology practices have found translation into design and policy perspectives, including more recently the plethora of smart city strategies. Mobile digital technologies, and more specifically the smartphone, figure centrally in many smart city policies and initiatives. By implication the smart city tacitly gestures towards the perceived topological limitations of physical-material space. In this way, the ground is well prepared for mobile digital technology-led solutions to overcome and transcend the physical restrictions of distance, adjacencies, boundedness, legal and regulatory frameworks, as well as experiential notions such as publicness. In the smart city, urban public space is transformed insofar as it is subject to a different set of logics. Urban public space is remade through geo-locational data, its clout is based on a new set of metrics that includes, posts, likes, tags, follows and mentions. In this way, personal or private space is that which is 'non-locatable' or 'not found', while 'truly' public places can be indexed and made searchable.

Mobile technology practices are part of a larger cultural shift that has heralded new aesthetic standards, forms, processes, and critically, expectations around the nature of people's experiences in and of urban public space (Manovich 2013). The discourse on post-smart mobile location-aware practices examined in this chapter describes a host of augmented and new ways that people communicate, interact, socialise, play, move through, interpret, but also produce, urban public space. The possibilities afforded by mobile location-awareness are argued to further shape the changing relationships between people, physical locations, and information brought about by mobile communications technologies. With the advent of LBSs, LBSN, LBGs, AR and locative-media, mobile technology practices are now seen as more than simply screen-based interactions to access a vast digital informational field; they are positioned as significant spatialising and meaning-making practices. The ways in which people, places, artefacts, or situations are ascribed meanings, and how these meanings might be mediated, perceived and interpreted—so the rhetoric goes—are now reworked through mobile technology practices.

The examination of discourse in this chapter has outlined how narratives of urban transformation are told through research studies of mobile location-aware practices under key themes including social capital and community building, political participation and engagement, interpretation, place-making and place-attachment. Particularly, this highlights how present claims that mobile technology practices extend the ways people establish attachment to places and change place-attachment processes (Schwartz 2015), or that mobile location-awareness as mediated through LBSN and LBGs incentivise both new and renewed interest and attention to the built environment (de Souza e Silva 2012: Özkul 2015: Lynch 2016), remain largely speculative and based on limited empirical evidence. Less discussed are the potentials for mobile technology practices to compromise, obstruct or control processes of place-attachment. Following the notion of liminality, this suggests that where mobile technology practices are conceived of as inciting transformative modes of revealing, of seeing the world anew and of problematizing extant and normative understandings, equal consideration must be given to the corollary of destabilization and of the opening up of opportunity but also risk.

Chapter 7: Mobilising space

"I'm impressed with people who can create new spaces with the right words" (Warhol 1975, p.147)

"The problem is not so much that space means very different things—what concepts do not—but that it is used with such abandon that its meanings run into each other before they have been properly interrogated" (Crang and Thrift 2000, p.1).

"Space is limited to the world of sensible experience and beyond that there is no longer any space worthy of the name" (Virilio 1995, p.141).

The examination of discourse in chapter 5 and chapter 6 has outlined key shifts in thinking on technology and space in the context of urban transformation ranging from the more generalised and predictive accounts of ICTs impacts on the city, to the empirically-based analysis of interpersonal mobile communications and mobile location-aware practices. This examination further charts how three key and formerly distinct areas of study on mobility, mobile communications and mobile location-awareness, have found increasing overlap. While mobility studies have more generally explored the local and global movements of people, goods and information, pre-smart mobile communication studies examined the social organizational and interactional implications of mobile device use. With the advent of mobile location-awareness features for smartphones, post-smart mobile technology research has sought to understand how location-aware practices change the ways people relate to the built environment in terms of embodiment, meaning-making, and place-attachment, as well as the cultural practices that arise from these relations. Accordingly, this chapter examines key representational strategies that have paralleled the growing popularity of mICTs and attendant changes in research foci. This presents a diverse range of discourse from architecture and urban studies, human geography, communications and media studies, HCI and urban informatics that has explored the implications of the digital-urban interface, and of urban transformation, by recasting the normative dichotomies of real/virtual, material/digital, public/private, physical/cyber to propose new hybrid spatialities including theories of code/space, hertzian space, hybrid geographies, recombinant space, mixed-space, augmented space, and netspace. This chapter considers the agency of these techno-spatial theories, and the various ways they reveal, explain, and communicate the interrelationships between the dynamic, and often ephemeral, spatiotemporal performances of mobile technology practices and urban public space.

7.1 The problem of space

Central to the rhetoric of a digital technological transformation of the city more generally is the question, or problem, of space with many scholars claiming that its perception, production, and meaning, has profoundly altered. Still others point to the renewed attention to matters of physical or locational space, collectively, individually, and as a topic of scholarly enquiry. This is true for Picon who argues that "…digital

technologies, now in their maturity, have *restored* the importance of space" (2015, p.13, my emphasis). From a computer science perspective Dourish argues that digital technologies force us to "re-encounter space" (2006, p.2). Further attesting to this, and adding to the plethora of spatial definitions that emerged from the 1970s onwards, when the analysis of spatialities preoccupied critics and historians alike, including Lefebvre (1991), Foucault (1986), Deleuze and Guattari (1984, 1987), Soja (1989), and Virilio (1991), are a range of more recent theorisations of space that draw focus to mobile digital technologies. This chapter explores the reasoning behind the various theorisations that argue that the pervasive adoption of mobile digital technologies has contributed to problematizing, and *mobilising,* long-standing and dichotomous models of space.

The question of space has long been addressed across multiple disciplinary contexts and interpreted in both wide and privileged ways. Space can be social, material, conceptual and physical, and as such, is equally considered to be a property of the thinking mind, as well the context in which the mind thinks. While different disciplines attend to space in different ways, common to each are the ways space operates as a representational strategy (Crang and Thrift 2000, p.1). Broadly speaking two key ideas of space have dominated spatial theory, the idea of 'absolute space', where space is understood as a prefigured, pre-existing container of action, and 'relational space', that understands space as constituted through multiple relations between objects and over time.

In the built environment-focused disciplines such as geography, architecture, landscape architecture, and urban studies, notions of space have been understandably aligned to the absolute space model, and grounded in a measurable physicality and its geometric representation. Yet, within the geographic tradition scholars claim to have moved away from a "…sense of space as a practico-inert container of action towards space as a socially produced set of manifolds" (Crang and Thrift 2000, p.2). Further, Tim Cresswell (2002) argues that for contemporary geographers the concept of location, understood as series of abstract points in abstract space, is of secondary consideration to the richer concept of place, understood as that which attends to the production and sites of individual, social, and cultural meaning. This speaks to the conceptual pairing of the terms space and place, terms that are sometimes used interchangeably, yet more often paired in ways that draw out distinctions. The conceptual division of space and place is

equally reflected in architecture and urban thinking where space typically assumes metrically measurable physical and material conditions—but does not necessarily account for human activity—leaving place the role of qualitative and experiential considerations. In this way, space is abstract and universal, while place is affective and meaningful.

While there is substantial interest in architecture to explore non-metric mathematical models of space and "heterogeneous spaces" (Hensel et al. 2009), these remain chiefly concerned with form-making or form finding. The physical-materialist perspective—Euclidean or topological space—continues to dominate thinking and design in the urban and architectural tradition and what is considered to 'matter'. Thus, with a focus on physicality and the visual, and with the endgame of determining static and permanent conditions to orchestrate pre-figured ideas of societal action, it stands to reason that the impacts of ICTs more generally, and of mobile technology practices more specifically, have remained little understood, and under-theorised in architectural and urban studies to date. In this context, understanding flows of digital information has been incongruous to extant ways of imagining, documenting, and representing urban and architectural space. Various scholars argue that to more productively address the relationships between the built environment, ICTs, and mobile technology practices, requires alternate, and moreover socio-material and relational, understandings of space (Graham and Marvin 1996; Mitchell 1999, 2003; Castells 2004; Crang and Graham 2007; McCullough 2007; Aurigi and de Cindio 2008; Willis 2008a; Moreno and Grinda 2013; Hill 2014).

As outlined in chapter 5 and chapter 6, mobile technology practices represent a key technological, but also, lifestyle trend of the twenty-first century (Houghton et al. 2014, p.24). Ways of moving, navigation and decision-making, socialisation practices, value-attachments, symbolism, and place meanings, are widely argued to have changed in relation to the wide-scale use of mobile communications devices, followed by smartphones and their attendant mobile technology practices. These impacts are precisely those that cannot be adequately explained through absolute, essential, and reductive understandings of space. Subsequently, to understand what is at stake when considering the impact of mobile technology practices for and within the built environment scholars have adopted relational, socio-material understandings of space

such as Oldenburg's third spaces (1989), Lefebvre's social production of space (1991) and Lofland's socio-spatial theorisations (1973, 1998). For example, scholars examining various mobile technology practices including Kopooma (1999; 2004), Hulme and Truch (2006), Humphreys (2010), Humphreys and Liao (2011; 2013), and de Waal (2014) have each applied and re-worked existing socio-spatial concepts, such as third place (Oldenburg 1989), parochial space (Lofland 1973, 1998), and social space (Lefebvre 1991) respectively.

Adopting existing socio-material theories of space has offered various ways to analyse, comprehend, explain, and reveal, the often 'invisible' or 'hidden' impacts of mobile technology practices, particularly in terms of their influence on the perceptions and productions of space. Still others have formulated new spatial theorisations, and proposed new concepts and neologisms, such as, reconfigured space (Townsend 2000; McCullough 2004), recombinant space (Mitchell 1995, 1999, 2003, 2005; Aurigi 2008), hertzian space (Dunne and Raby 2001a; Mitchell 2003; Dunne 2005; Varnelis 2008), mixed-reality (Galloway 2004), augmented space (Manovich 2006), hybrid space (Dunne and Raby 2001b; Sheller and Urry 2003, 2006b; de Souza e Silva 2006; Kluitenberg 2006; Willis 2012; de Souza e Silva and Sheller 2015), codespace (Forlano 2008, 2009a, 2009b), relational space (McQuire 2008a) and netspaces (Willis 2016), to name a few.

Hybrid theorisations of space advance the position that mobile technology practices are not simply contained by the frame of urban space, but rather are implicated in its very production (Agre 1999; Brewer and Dourish 2008). In this way, and as Forlano reflects "[t]he digital and material are no longer considered to be separate and discrete entities…they have been integrated into hybrid forms such as the digitally material" (2013, p.2). The mobilisation of ICTs, together with the availability of wireless internet in urban public space, the falling costs of data plans for mobile devices, and the convergence of numerous forms of technology into the smartphone, have collectively influenced these changes, as well as created new, socio-spatial behaviours. Equally, with internet-enabled mobile devices, and later smartphones, communications practices and informational practices have been made far more visible in urban public space. This has served to visualise, but also make material and tangible, a range of practices that were previously held to be virtual, immaterial, and in effect, distinct from everyday life.

As such, virtuality has become a fundamental dimension of our everyday reality (Castells 2009).

Chiefly, the mobility and pervasive use of ICTs is argued to have placed digital technologies, and digital technology users, in a new set of relationships to urban public space. Subsequently, a great deal of scholarship has re-theorised space in relation to the ways social practices and technological actors work together to produce new forms of sociality and urban spatial processes (Forlano 2008). Rethinking and re-theorising space offers new ways to examine the relationships between technological shifts, social, spatial and political changes. Theorisations of reconfigured, recombinant, convergent, immersive, hertzian, and hybrid space, are argued to, in various ways, challenge long-established binary concepts such as physical/cyberspace, real/virtual space and public/private space. This chapter considers theorisations of space that have more broadly addressed the themes of technology, society, and space alongside those that more recently theorise mobile technology practices, sociality, and urban public space in the context of transformation.

7.2 Of other and hybrid spaces

Reflecting on architectural discourse that had speculated on how the immaterially understood realm of cyberspace would impact the material world of the built and urban environment, architectural theorist M. Christine Boyer (1996) noted how,

> *"Much of this theory either assumes implicitly or states explicitly that a profound mutation has taken place, one that effects a transformation from the machine city of modernism to the informational city of postmodernism. This transformation, it is said, replaces the traditional western space of geometry, work, the road, the building, and the machine with new forms of diagramming…the principles of ordinary space and time are altered beyond recognition"* (p.14).

Connecting technological developments to spatial transformation is, of course, hardly new. Such thinking can be located in a long trajectory of spatio-technological analysis, including, from the late nineteenth century onwards, prominent figures such as sociologists Georg Simmel, Siegfried Kracauer, and philosopher and writer Walter Benjamin. Reflecting on the impacts of the pace and scale of the new urban metropolis, as well as early twentieth century forms of mass media including cinema, telephony and

radio, these writers located evidence of technologically-driven change in the human psyche (psychological space), and in social behaviours (social space).

For a number of urban and architectural scholars writing in the early 1990s, the growing ubiquity of digital technologies signalled pending transformations for built and urban space. Narratives of technologically-driven spatial transformation swung wildly between technophilic and technophobic positions, while for a great many others such technologies were simply cast as extraneous to the concerns of the built and urban environment. For those espousing tales of dystopic transformation, electronic and telecommunications technologies represented the imminent possibility of disembodiment and the dematerialization of the urban and built environment (Boyer 1992, 1996; Pawley 1998; Virilio 1991). Chiefly, the dematerialization perspective offered, not that the city itself would physically disappear, but that long-standing roles of physical-material urban public space would shift and/or recede, and people's value-attachments and perceptions of built and urban space would fundamentally change.

Critically, popular disembodiment and dematerialisation perspectives relied heavily on the existence of an 'other' space, namely cyberspace, and in many ways these dystopic narratives contributed to its very production. Cyberspace locates digital information, and our interactions with it, in a realm set apart from real or actual space, understood as the physical space that the corporeal body is located in. The spatial representation of cyberspace as a city-like grid through which information flowed, is popularly argued to have stemmed from William Gibson's (1984) science fiction novel *Neuromancer* (Boyer 1992a, p.115). In this way, the cyberspace metaphor rendered the otherwise black box of computational processes 'visible', and thereby more comprehensible. While this spatial representation seemingly created a space in which digital information could reside safely away from actual, or real space of the world, like the metaphor of the machine for the Modern era, the metaphor of the computer infiltrated the real in other ways. Cyberspace became a powerful urban imaginary in its own right, and influenced ways of conceiving, representing, planning and inhabiting actual cities (Boyer 1992).

For Boyer (1992; 1996) and others, cyberspace constituted the dominant new imaginary that supplanted the prior machinic model of order and organisation for cities. Recalling

Gilles Deleuze (1992, p.5), she asserted that the "disciplinary societies that moulded behaviour [were] being replaced by numerical societies of modulating control facilitated by computer technology" (p.18). Where previously notions of space and time had been grounded in locations, zones, and enclosures, she countered that now "[t]he code, not the norm, becomes the important device; now it is the password, not the watchword that provides or inhibits access" (1996, p.18). In this way, electronic telecommunications and networked information were held to have put into crisis the Foucaultian disciplinary space of Modernism.

While largely held to be an invisible and immaterial other realm, nonetheless cyberspace represented the threat of an insidious and less transparent regime of discipline and control. Yet, regarding cyberspace in this way, also gestured towards an unsettling of a disciplinary terrain. After all, despite its sinister overtones, Foucault's disciplinary society had endowed physical urban and built space with significant organisational power, while cyberspace appeared poised to strip the city—and by extension architecture—of those extant roles. Boyer (1996) adopted a commonly held perspective that cyberspace constituted "a new electronic, invisible space that allows the computer or television screen to *substitute* for urban space and urban experience" (p.242, my emphasis). From a less sensationalist position, Mitchell (1995) noted that as a key platform that brings cyberspace into being, the internet is "profoundly *antispatial*. It has nothing like the Piazza Navona or Copley Square", and rather it stands to "…eliminate[] a traditional dimension of civic legibility" (p.8).

With cyberspace popularly regarded as a metaspace or hyperspace superimposed above the level of reality, it was assumed that modes of command and control had simply been transferred to this other space. In this conception, while it was accepted that cyberspace and actual physical space could exert forces on each other, they were not seen to be co-constitutive. Casting cyberspace as a parallel, superimposed, and substitutional realm apart from everyday life, functioned to uphold the long-standing conceptual separation of technology and space. In so doing, this served to preserve dominant materialist or physicalist perspectives of space that had largely regarded space as a container for social action, and that which is produced and organised by architects and planners (Forty 2004).

By the close of the 1990s, as the previously distinct fields of telecommunications, computing, and media technologies converged to form a core group of "digitalised technologies" (Graham and Marvin 1996, p. 14), and the internet assumed mainstream status, notions of network space, non-linearity, rupture, break, and the discontinuity of hypertext began to challenge the cyberspace hyperbole. Accordingly, Philip Agre wrote, "[a]s the Internet matures and becomes integrated with the institutional world around it, it is becoming increasingly clear that science fiction has disserved us...the Internet is not growing apart from the world, but to the contrary is increasingly embedded in it" (1999, p.3). More recently, Castells (2009) has offered that "it is not a prediction but an observation to say that on-line communities are fast developing not as a virtual world, but as a real virtuality integrated with other forms of interaction in an increasingly hybridized everyday life" (p.xxix).

Conceptualising relationships across and between material and immaterial realms—between objects, information, and people, and as nodes and vectors within networks—challenges binary conceptions of the cyberspace/physical space and virtual/real space. In the lead-up to the new millennium, the metaphor of network space gained traction, supplanting the computer-constrained metaphor of cyberspace. Of course, as a logical device the network metaphor is far from new, and has long been discussed in the natural and social sciences and documented as occurring in both complicated matter and in living systems (van Dijk 2006, p.24). Network thinking saw particular application in the advancement of cybernetic and systems theory during the mid-twentieth century. In literary and linguistic studies, for example, modes of structuralist thought privileged the analysis of systemic modes of meaning-making (West-Pavlov on Kristeva 2009, p. 38).

A broader paradigm of network thinking equally emerged in philosophy, critical geography, and science and technology studies, including the social complexity theories developed by Deleuze and Guattari (1984; 1987), and expanded by Manuel de Landa (2009), Actor Network Theory (ANT) developed by Michel Callon, Bruno Latour and John Law, Activity Theory (AT), Thrift's (2008) Non-Representational Theory (NRT) and mobility theory, that enfolds each of these theories (Sheller and Urry 2003; 2006a, 2006b). Broadly speaking, while they individually privilege certain methodologies, these theories share a relational approach that reflects an anti-hierarchical, diasporic flavour, and generally opposes a linearity of casual relations.

7.3 Spaces that flow and network thinking

In 1991 prominent British public policy advisor Geoff Mulgan commented that, "[c]omputers have done much to spread familiarity with the idea of logical rather than physical space, with their topological representations of flow diagrams, branching trees and other patterns…" (p.20). For Manuel Castells (2009), network logic provided a useful metaphor to explain the shifts in the social and economic systems and processes of Western late capitalist information-based societies. Similarly, Bruno Latour (1996) argued that "levels, layers, territories, [and] spheres" (p.370) were inadequate ways to conceptualise the complexity of the contemporary world. Alternatively, the network metaphor articulates different senses of scale, and of the scaled relationships between people and places.

Castells reasoned that as ICTs and the internet became increasingly mainstream during the 1990s, the network shifted from an abstract notion to a spatial process. Following this, Castells (2009) coined the term 'network society' to describe what he deemed as a significant shift in the organisation of society, from primarily defined by geographical and physical situated-ness—the space of places, to those now constituted through networked global information systems—the space of flows. The space of flows describes a hybrid, mobilised space of interacting immaterial and material conditions—a networked space—that is further operatively drawn into focus by contrasting it against a space of places.

Often read as oppositional, the space of flows/space of places suggests a relegated role for geographically understood 'places', limited as such by their boundedness as opposed to the so-called extensibility of the space of networked flows. More accurately, what Castells points to are how the dialectic of the space of flows/space of places in turn shifts the processes of socio-spatial meaning-making, and the role the built and urban environment plays therein. While the 'space of flows' chiefly connects networked ICTs to macro-level socio-economic organization, and thus spatial forms, Castells' (2009) more recent observations point to how networked ICTs are a major catalyst in the twenty-first trend towards urbanisation. That 50 percent of the world's population now live in urban areas is taken as clear evidence of a significant urban spatial transformation. And from this perspective, far from signalling the end of cities, or

undermining the significance of physical urban space, this points to a "growing valuation of urbanity, street life, civic culture, and meaningful spatial forms" (Castells 2004, p.89). Despite a focus on spatial transformation at a macro-urban scale, Castells (2009) also speculates on how the space of flows recasts relationships between architecture and society, arguing they are no longer clear, and are rather blurred. (p.449). Like Mitchell and Boyer, Castells calls into question the long-standing communicative role attributed to the built and urban environment, and how digitally networked ICTs are reconfiguring these roles.

As a theory of spatial transformation, the space of flows centralises the "production, transmission and processing of flows of information" and how this restructures complex relationships between people, commodities, communication, information, and capital (Castells 2009, p. xxxii). This is a theory of space concerned with macro-level social-economic dynamics, and thereby is chiefly interested in how ICTs contribute to influencing overarching modes of production and consumption. In short, as Kitchin and Dodge offer, "[t]he general thesis [of the network society] argues that ICTs are transformative technologies that enable a shift from an industrial to postindustrial society by altering the conditions through which social and economic relations take place" (2011, p.31).

Network thinking has been far from absent in contemporary architectural discourse (Wigley 2001, 2007). Yet, rather than pointing to a re-theorisation of co-constitutive material/immaterial space to account for the influence of digital technologies on socio-spatial processes, architectural discourse tends towards a rhetoric of network flows, nodes, and webs, in ways that remain curiously inward-looking and defensive (Wigley 2000, p.2). As discussed in detail in chapter 4, the network metaphor became a fashionable logic for interpreting, explaining, and symbolising, contemporary productions of architecture and the city. Adopting the metaphor of communication systems, where interiors became circuits and spaces could nurture and organise flows, operates to seemingly expand architecture's remit beyond the confines of enclosing walls (Wigley 2007, p. 33-34). As Adrian Forty (2000) describes, during the modern period the newly adopted concept of 'space' served as a way of identifying and legitimising a new form of architecture. In this way the concept of space became strategically positioned as an *object* of architectural practice, and a way for architects to

"present their labour as mental rather than manual" (Forty 2000, p.265). In ways similar, the concept of network space is more readily employed as an alternate model for conceptualising architectural practice, over situating architecture within a larger system of non-hierarchical relations.

7.4 Relational space

It was from a position of recognising the limitations of the architectural concept of space, including the commonly held belief that architects 'produce' space, coupled with the failure of the Modernist planning approaches in post-War France, that Henri Lefebvre (1991) is argued to have proposed an alternate theorisation of space (Forty 2004, Stanek 2011, Shields 1991). Lefebvre's production of space is a radical critique that calls into question how space is conceptualised within urban and architectural thinking and discourse (Forty 2000). Yet, Lefebvre's approach opposed existing sociological approaches that had tended to focus on understanding the social primarily through quantitative and statistical methods (Stanek 2011). According to Stanek (2011), Lefebvre's triadic theory of space reflects three key theoretical decisions, firstly, a shift from the observation of static 'space', to understanding the process of its production; secondly, recognition of the multiplicity of spatial practices as those that make space socially productive; and thirdly, attention to the political influence (p.ix). In short, Lefebvre understood space to be produced dynamically, through social action, and political idealism.

Lefebvre's triadic theorisation of space proposes two antithetical paradigms, firstly the consumption of space, described in triadic terms as perceived, conceived and lived space, and secondly the practice of spatial appropriation, described as spatial practices, representations of space, and spaces of representation (representational space). Lefebvre (1991) argues that space describes three key things, including the empirical disposition of things in a landscape, attitudes and beliefs, and habitual practices. Given this, the production of space describes an ongoing negotiation of tensions between concrete and abstract conditions. As it is a concrete abstraction, that is, "simultaneously a medium of social actions, because it structures them and is a product of those actions" (Gottdiener 1994, p.128), Lefebvre argues that space can *only* be understood dialectically.

The significance of Lefebvre's theory of spatial production to this research is in the way he identifies space as a relational condition. As such, Lefebvre opposes totalising or absolute definitions of space, and instead proposes a contingent, dynamic, and processual theory that addresses a plurality and relationality of spaces. He reflects that "[w]e are confronted by an infinite multitude of spaces, each one piled upon, or perhaps contained within, the next: geographical, economic, demographic, sociological, ecological, political, commercial, national, continental, global. Not to mention nature's (physical) space, the space of (energy) flows, and so on" (Lefebvre 1991, p.8). While this perspective appreciates the ways different disciplines and epochs interpret space in very specific ways that can be determined as equally valid in their own right, it also recognises that rigid disciplinary frameworks can actively obscure the interrelationships between spaces, and thus richer comprehensions of space.

Lefebvre's triadic theory of the production of space reasons that space is the product of the thinking mind that produces and is influenced by the spatial context (both physical and conceptual as it embodies social relations and ideologies) in which such thinking occurs. Space, in this sense, is articulated through three fields of concern: the physical, the mental, and the social. Lefebvre argues that the separation of the space produced by thought and situational space (physical, social, and conceptual) was a key fault of modernity. Alternately, his trialectic approach demands consideration of the co-constitutive nature of the relationships between each of the aforementioned 'spaces'. While all three spaces may operate simultaneously, within each exist forces of domination or repression that work to suppress of elevate one space over another (Shields 1991, p.56). As Lefebvre observed, "in reality each of these…kinds of spaces involves, underpins and presupposes the other" (1991, p.14).

As a relational theory of space, Lefebvre's social production of space predates the more recent trend towards hybrid conceptualisations. While not directly concerned with (digital) technologies, in Lefebvre's trialectic model the conventional subject-object division is displaced as the triad interconnects both abstract (immaterial) and material spaces. What Lefebvre's theory offers is a way of understanding space from a range of angles that cut across disciplinary biases. In this way Lefebvre's spatial theory extends to become a methodology to analyse places and situations, and to problematise normative ways of seeing. Two key examples that adopt Lefebvre's triadic theory in

ways that relate to this research include Don Mitchell's 1995 case study of the People's Park, Berkely Califorina and Humphreys and Liao (2011) case study of the mobile location-based service *Socialight*.

In Mitchell's case study, the Lefebvrian lens is adopted to draw out both common and differentiated ways of understanding the concept of public space in contemporary cities from the perspectives of various users and policy makers (1995, p.115). For Mitchell applying Lefebvre's spatial triad served to illustrated the contested nature of public space and how its "[d]efinitions…are not universal and enduring; they are produced rather through constant struggle in the past and in the present" (Mitchell 1995, p.121). For Humphreys and Liao (2011), the Lefebrvian lens operated to draw into relationship technology practices, social practices, and concepts of place. More specifically, through a Lefebvrian framework the 'transformative' impacts of the mobile location-based technology practice *Socialight*—that allowed users to leave virtual 'sticky notes' about and in geotagged locations in New York City—were understood in socio-spatial terms, and thus made visible. Subsequently, Humphreys and Liao (2011) argue that the ability for users to communicate information about places transforms the spatial practices of those with access to the geo-tagged messages, while the social connection between users is also reasoned to influence the likelihood of a person visiting a place.

Complementing the large body of discourse that has more generally addressed the influence of ICT networks on socio-spatial change, as well as research that re-works existing spatial theories, more recent theorisations often proceed from technically specific foci, including new media (content), the digital interface (use and interaction), and software and code (drivers/enabling). These perspectives locate significant ontological and epistemological shifts in technological objects, processes, and practices. Common to each of these perspectives are hybridities where technologies are seen as not simply operating within space, but rather become significantly implicated in its very production.

7.5 Hertzian spaces and landscapes

For Dunne and Raby (2001a) space has long been constituted by the co-mingling of material and immaterial conditions. More specifically, they adopt the term "hertzian space" to describe the often overlooked 'invisible', yet operative, electromagnetic

environment or landscape. This theory implicates a far wider range of technologies in the transformation of space, from electricity, radio transmission, radio and telecommunications, to wireless internet. Dunne (2005) writes that over the course of the twentieth century, this has seen "space evolve into a complex soup of electromagnetic radiation" (p.101). Yet, the force of change associated with prior technologies is regarded to pale in comparison to the rapid changes brought by the more recent digital technologies such as the advent of wireless internet access in public spaces. Accordingly, Dunne argues, wireless internet represents "…a new kind of connection to our artifactual environment" (2005, p.107).

A number of scholars have more specifically explored how access to wireless internet services in public spaces has influenced socio-spatial organisation (Hampton et al. 2010; Hampton et al. 2014; Forlano 2008, 2009a, 2009b; Willis 2016). Through multiple network ethnographies of wireless internet use and adopting an inductive reasoning approach, Laura Forlano (2008, 2009a, 2009b) theorises the concept of "codescapes" (2008, 2009a), and elsewhere "codespaces" (2009b) as a new theorisation of space. Codespace is argued to more effectively account for the convergence of physical and digital spaces; the merging of 'code' with physical space (2009a, p.345). Forlano (2009a) reasons that describing Wi Fi networks as overlaying physical space is an inaccurate description as they tend to disobey its physio-spatial conditions and associated regulatory frameworks. Instead, Wi Fi networks are argued to reconfigure urban space in the ways they wilfully permeate and traverse its physical and legal spatial boundaries, including those that structure notions of public and private space. Yet, it is perhaps more accurate to suggest that Wi Fi networks are reconfigured by the existing conditions of urban space, as Wi Fi operation can be significantly constrained by physical structures resulting in reflections, diffraction and scattering, and in short, signal obstruction.

Despite addressing the question of how *code* meets place, Forlano (2008, 2009a, 2009b, 2013) is critical of the perspective that software operates as an overarching organisational force. She argues that mobile and wireless technologies complicate this perspective given they are more explicitly concerned with physical space. In response to Lawrence Lessig's (1999) arguments in *Code and other laws of cyberspace*, Forlano (2008) reasons that while software/code can regulate people's behaviours in ways

similar to the socio-organisational attributes of built space, this does not fully account for the convergence of physical and digital spaces (p.4). As a theory drawn from an ethnography, Forlano argues that codespaces more readily attends to the social and cultural practices associated with WiFi networks, including communication, collaboration and modes of innovation.

7.6 The automatic production of space, and code/space

In 2011 technology entrepreneur Marc Andreeson famously argued that "software is eating the world" (quoted in Hill 2014, p.6). Andreeson's claim refers more specifically to a significant shift that had taken place over the decade previous that saw significant economic investment directed from computing hardware to software. Andreeson qualifies this is stating that "[s]oftware is…eating much of the value chain of industries that are viewed as primarily existing in the physical world" (2011). This describes a shift from a production to information/knowledge economy, and from the attribution of economic and symbolic value from material things to immaterial flows. More recently, this has been furthered by companies that have leveraged existing software platforms, but also the pervasiveness of mobile computing, to realise new ways of addressing human needs, such as mobility, accommodation, and hunger. This is exemplified by Tom Goodwin's (2015) now equally famous statement that,

> *"The world's largest taxi firm, Uber, owns no cars. The world's most popular media company, Facebook, creates no content. The world's most valuable retailer, Alibaba, carries no stock. And the world's largest accommodation provider, Airbnb, owns no property".*

A number of scholars have long-argued for the effectivity of software and code in affecting spatial transformations. Thrift and French's (2002) automatic production of space, Graham's "software-sorted geographies" (2005), as well as Rob Kitchin and Martin Dodge's (2011) theory of code/space each direct attention to the ways software and code are deeply embedded in everyday life, as coded objects, coded infrastructures, coded processes, and coded assemblages (Kitchin and Dodge 2011, p.20). Accordingly, Kitchin and Dodge (2011) urge "…spatial theorists to think more specifically about how software underpins the nature of ICTs and shapes its functioning and effects" (p.38).

The concept of the automatic production of space (Thrift and French 2002), as well as Thrift's non-representational theory (2008), direct attention to the impact of software on the everyday, the habitual, and the banal. These theories proceed from the position that a new kind of electronic and calculative background space has emerged that increasingly impacts everyday practices. This positions software as complexly interwoven into everyday life in ways that has meant—as per the ubicomp paradigm's primary objective—computational operations recede into the background and away from direct consciousness. Thrift has coined various phrases and terms to underline the broad impacts of software in relation to space, from describing "new kinds of electronic background time-spaces" (2004 p.583), a new paradigm of "qualculation" (2004, p.584), to the second-order impact of Euclidean calculation as a new world of "movement-space" (2010, p.6-7).[1]

Kitchin and Dodge (2011) equally place emphasis on the co-constitutive nature of the relationship between software and the spatiality of everyday life (p.39). Yet, they also point to more specific software-mediated practices as those where "code is essential to the form, function and meaning of space" (2011, p.201). In adopting the concepts of transduction and individuation, code is argued to transduce everyday life and in so doing, modulate socio-spatial relations (Kitchin and Dodge 2011, p.205). Particularly, cited examples include extant typologies of space that are now largely governed by, and thus contingent on, software operation, such as airport check-ins and supermarket check-outs. From this perspective, both the functional and symbolic nature of the airline check-in or the supermarket check-out are seen as contingent on code. Put another way, software is seen to alternately enable the activities and functions that have typically defined those spaces in spatial ways. Code/space argues that software operation and its code is what now allows many spaces, actual and virtual—given the advent of mobile such as online check-in platforms—to come into being.

Code/space offers an ontogenetic understanding that, while not initially concerned with mobile computing, is easily extrapolated to mobile technology practices. Significantly, code/space it is not a universal claim and it does not presume to account for all space,

[1] Thrift (2010) argues that the first-order impact of calculation occurred when the Euclidean model of numbered and angled space was applied to chart geographic (static) space. He argues this placed a "grid over the world" that has only recently been dynamically re-worked in the ways software operates to calculate and track the movement of objects, people, and information (p.6-7).

but rather usefully explores specific instances. In doing so, code/space is revealed as characteristically contingent and particularly open to rupture (Kitchin and Dodge 2011, p.131).

7.7 Mediaspace, augmented space, and monitored space

Alternately, for media scholars Nic Couldry and Anna McCarthy (2004) their dialectical concept of "MediaSpace" centralises electronic (new) media as a transformative force in a socio-spatial context This describes how spaces and places are increasingly consumed and (re)produced through new media. They argue that electronic media and space are the "obverse of each other" (p.1). This not only implicates media systems and institutions in spatial processes, it treats digital media as material and spatial. In so doing, this expands communications and media studies beyond their primary and originary subject of textual interpretation to considerations of the material organisation of space (p.4). (2004). In this way, media is reconceptualised as a social process that is thereby "stretched out in space in particular ways, and not others" (Couldry and McCarthy, 2004 p.4). Exploring the interrelationships between media forms and space problematizes disciplinary-specific objects of study. The concept of media is problematized through a spatial lens, and traditional ideas of space as enclosure are problematized by the presence of forms of media that are able to surpass the boundedness of physical-geographical space. That new media constitutes a significant force of transformation, is also a position advanced by scholars including Manovich (2001, 2006) Berry et al. (2010), and de Waal (2014).

While Manovich explores the content of new media as a cultural product, he equally places significance of the way the digital medium that communicates new media impacts its affects. A range of computing interfaces, from CCTV Surveillance systems that extract information, to mobile and locative media ('private' or individualised augmentation) and electronic screens ('public' augmentation) mediate information within and about the environment. For Manovich the digital informational interface 'transforms' physical space into a data space (2006, p.221). Yet, CCTV surveillance systems do not act directly on the physical built and urban environment, but rather record it. More accurately, this describes a process of re-interpreting or representing physical space through technological interfaces and as data. To differentiate, Manovich

further argues that the overlay of physical space with dynamic and changing information transforms it into a new kind of physical space that he terms as an "augmented space" (2006, p.223). As locative-media generally relies on individual users being 'locate-able' in the geo-spatially networked sense, he additionally adopts the more sinister sounding "monitored space" (p.223).

7.8 Hybrid spaces and mobile computing interfaces

The shift in human-computer interaction, from engaging with a desktop personal computing interface, to multiply mobile computing interfaces has broadly affected ways of thinking and theorising the real and the virtual (Bell 2007, p.30). Knowing how to operate a computer has replaced knowing how it works (Bell 2007), and this in turn has catalysed a shift from a culture of calculation, to culture of simulation (Turkle 1995). The role of the interface is significant as it translates computer code into an actionable space that the user—without expert computing knowledge—can interact with. The computing interface mediates and shapes the experience of information. Subsequently with more sophisticated, yet 'user-friendly' interface design, the commonly held view of computing as a rational calculating machine has shifted, and the experience of computing and information are held to have become 'aestheticised' (Turkle 1995; Dunne and Raby 2001b; Dunne 2005; Manovich 2013).

Claims made to the mediating significance of the contemporary mobile computing interface extend from the orchestration of new social forms, to grand metaphysical implications. This reinforces McLuhan's key argument that the "the medium…shapes and controls the scale and form of human association and action" (2003, p.20). The various digital screens people interact with, from computers, to iPads and smart phones are argued to have altered people's actions, perpetual habits, and moreover, aesthetic preferences (Manovich 2006; 2008; 2013).

Castells (2004) ascribes to the role of interface the significant task of negotiating between the competing logics of the space of flows/space of places. Accordingly, the interface is the site where electronic communication meets physical interaction thus combining networks and places in ways that *transform* the city (2004, p.85 my emphasis). For Virilio (1991), this transformation is understood from a far less neutral perspective, as he strongly argues that the screen interface produces a distancing from

the ‘real’ experience of space (p.12). Conversely, the more recent theories of hybrid space (de Souza e Silva 2006; Verhoeff 2012) and mobile media space (Farman 2012a), point to various affordances of the mobile computing interface, and the ways it can enhance, enliven, and augment, the experience of the ‘real’.

The mobile interface figures centrally in hybrid space accounts as the point at which the relationships between digital information, the individual user, and urban space are brought together and subsequently reconfigured. Nanna Verhoeff (2012) describes the mobile interface as a “hybrid device” that makes a “broad range of interactive practices possible” (p.34). For de Souza e Silva (2006) the pervasive and everyday use of the mobile interface enacts a conceptual shift *from* cyber *to* hybrid space. In this way, what is transformed is not only the nature of social connectivity, but also ways of thinking and representing the space of digital information flows. Farman writes that “[c]onnecting with familiar spaces in a new way through mobile locative social media offers the potential for physical space to be transformed into hybrid space” (2012, p.74). These quotes evidence a marginally different emphasis and interpretation of hybrid space. While de Souza e Silva limits her description of a hybrid space as the confluence of online/offline social organisation and connectivity, Farman’s hybrid space denotes a multiplying of the perception of physical space enabled by the mobile interface’s access to the multiple perspectives available about a location and are geo-tagged through a social media platform.

Hybridity is a popular metaphor that seeks to recast the relationships between people, the built environment, and digital technology, in ways the strip away or remove the prior autonomy of a virtual or cyber space. In outlining research into early collaborative computational environments, including remote video-conferencing scenarios, Steve Harrison, of the Xerox Palo Alto Research centre, and computer scientist Paul Dourish (1996) describe how remote video-conferencing scenarios facilitate a merging of physical and virtual space to form a hybrid media space (Harrison and Dourish 1996, p.6). Their concept of hybrid space more specifically distinguishes between the social interactions made possible through virtual online environments, and those that incorporate the physical context of the user. For Harrison and Dourish (1996), a collaborative media space creates a “hybrid space which includes real, physical me” (1996, p.73).

Dunne and Raby (2001b) have previously described the use of a range of personal digital objects as hybrid inventions, hybrid materialities, and those that produce hybrid situations. As interfaces that connect material and immaterial spheres of action, digital objects are argued to thus dissolve the ideas of physical and digital space. The authors speculate that these objects collectively constitute an invisible and elastic Cellular City that overlays extant urban territories to fuse the physical with the virtual. Particularly, 'fused space' is reasoned as distinct from virtual space or cyberspace, in the ways it envelopes rather than excludes fleshy bodies.

In de Souza e Silva's (2006) conception, hybrid space refers to new forms of social connectivity, and socio-material organisation as facilitated through the mobile digital interface. This describes how mobile connectivity allows situated and remote social situations and places to be drawn into new trans-spatial proximities. In this way, hybrid space is made distinct from other digital technology based 'mixed' space conceptualisations such as AR, and alternate space conceptualisations such as VR. It is further reasoned that, regardless of the absence of any direct screen-based engagement, the mere act of carrying a networked mobile device simultaneously enfolds the user into remote, as well as situational, social contexts (de Souza e Silva 2006, p. 262). The concept of "net locality" extends this theorisation to further centralise the ways the mobile computing interface facilitates location-aware practices. Emphasis is given to how the affordances of the mobile computing interface have facilitated a shift from an 'other' space of the internet—a separate digital information space—to a hybridised in-the-world information space, where digital information is everywhere, and is thus, "all around us" (Gordon and de Souza e Silva 2011, p.2-3).

The theme of the mobile computing as an interface and its relationship to the experience of being-in-the-world is further explored by de Souza e Silva and Frith (2012) and Farman (2012a). In these accounts, the mobile device is described as an interface due to its connective properties, including those that situate users within a network of information that enables connections to both people and places. The mobile digital interface figures significantly in these accounts as that which affects and defines the perceptions of the space people inhabit, as well as the nature of their interactions interaction (de Souza e Silva 2006, p.261).

Extending key ideas of Simmel (2005) and Benjamin (2002; 2008), who each wrote about the ways that individuals psychologically managed the over-stimulating conditions of the early twentieth century contemporary city, de Souza e Silva and Frith (2012) argue that as the city is now overloaded with digital information, the mobile computing interface performs a necessary role of filtration. The mobile interface is thus framed as the dominant way people currently address the modern problem of 'attention', and is thus described as a device to help people "manage and control their interaction with the public spaces around them" (de Souza e Silva and Frith 2012, p.20). Moreover, the mobile computing interface is argued to be a *new* interface, and subsequently, way of perceiving and interacting with public space, and the mobile location-aware practices are argued to further extend this influence to the ways people come to 'know' locations.

From a different perspective, Farman (2012a) reworks a fundamental inquiry of phenomenology for the mobile digital age by claiming that the mobile computing interface—and screen-based interaction—extends rather than cleaves bodies from the nature of experience. In so doing, and following a line of thinking explored by Elizabeth Grosz in *Architecture from the Outside: essays on Virtual and Real space* (2001), Farman argues that extant understandings of real and virtual space are inadequate to explain how people currently interact with a mobile computing interface (p.36). With the advent of computing technologies and the internet, the notion of virtual as a 'cyberspace', or digital information space, has received widespread prominence. Yet, the virtual is not new to cultural life, nor is it a concept that belongs exclusively to the space of computing and digital technologies, this is merely a recent guise (Shields 2003). As such, computing technologies can be said to have 'transformed' the concept of the virtual—once more readily associated with the mind, the space of imagination, and potential—into a technological construct (Shields 2003; de Souza e Silva and Sutko 2011).

While given the early internet of the 1990s was largely accessed from a fixed computing interface helped reinforce the distinction between digital and physical space, the advent of the mobile computing interface has troubled this apparently clear divide. In this way the virtual has experienced somewhat of a reversal of fortunes, as it is argued to have permeated, and thus become absorbed into the spaces of everyday life. A

hybrid space describes a troubling of the dichotomous construct of real/virtual space. Yet, de Souza e Silva's (2006) hybrid space is contingent on a "continual condition of connectivity that simultaneously situates a device user in a digital and physical space" (p.xx). A hybrid space is predicated on the user being 'always-connected', and does not account for service disruption, a user forgetting to carry their phone, or simply someone who does not own a mobile-networked device. For people in these situations—without virtual connectivity—are the distinctions between real and virtual space any more or less evident?

The real/virtual space dichotomy is equally called into questioned from the opposite perspective, that is, in the ways the body can be argued to newly infiltrate the virtual. This is understood in Harrison and Dourish's (1996) much earlier study of collaborative computational environments, as well as Farman's (2012a) more recent discussion of mobile computing. For Farman (2012a), the mobile computing interface constitutes an extension of the human sensory system that transforms our ways of being-in-the-world. His theory of the 'sensory-inscribed body' combines phenomenological and post-structuralist concepts to argue that "we are read as embodied subjects with and through mobile technology" (2012a, p.30). Most obviously, and in ways similar to de Souza e Silver's (2006) description of hybrid space, he argues that mobile technologies enable a user's sensory mode of embodiment to be simultaneously located in situated as well as virtually remote contexts (Farman 2012a, p.33). He further offers that through the mobile interface the "space of the digital and the space of the material [are in] constant interplay and permeability between one another" (2012a, p.36), and in this way he reiterates the connective basis of the aforementioned hybrid theorisations.

The virtuality of mobile media engagement can be equally understood as a bodily experience. For Farman interacting with the interface of the mobile device enacts a hybrid production of space that is "experienced as a collaboration between information, representation, and materiality" (Farman 2012a, p.13). More specifically, he suggests that locating one's self simultaneously in digital space and in material space transforms embodied space in ways that exposes the false dichotomy of the real/virtual (2012a p.16). The virtuality of mobile media space and its experiential capabilities throw into relief what is real (Shields 2003, p.20). In this way, Farman places the virtual in the service of the real when he argues that "the virtual is not the opposite of the real; instead

it is a component of experiencing the real" (2012a, p.22). Significantly, this confronts the assumptions that the sensations provoked by and through mobile technology practices and mobile media are any more or less authentic than the stimuli of the physical environmental.

7.9 From spaces to places

Returning to the question of mobilised meanings as discussed in chapter 6, a further way that space is argued to be transformed through mobile technology practices is in the ways mobile location-awareness, LBS, and in particular, AR applications are reasoned to transform space to place. Farman attests that mobile digital technologies "imbue space with meaning, thus transforming a space by giving it a sense of place" (2012a, p.40). Moreover, mobile locational technology practices, and particularly those that utilise AR features, are argued to transform everyday experience into an experience of multiplicity. Likewise, de Souza e Silva and Sutko (2011) describe location-awareness and locative media as those that create a "doubled perception of space", that consists of an experience of the physical-real through the body as well as through its augmented representation on a mobile device (p.24).

For Willis (2016) this is particularly true of mobile location-aware technology practices that in her view "initiate a re-coding of place, moving from map-based and abstract to social and networked" (p.34). Describing her personal use of Foursquare, Willis argues the experience of locations "mediated through a mobile phone, highlighted a shift in the complex relationship between the city as a place and the city as information. This revealed a more complex intertwining of the two" (Willis 2016, p.34). Moreover, Willis attributes the affordance of mobility through computing as that which has not only merges physical and online space, but also contributes to valorising the meaningfulness of "inbetween places" (Willis 2016, p.36). For Gordon and de Souza e Silva (2011) locations gain immediately greater significance, and moreover a global reach and thus "impact" through networked connectivity (p. 168).

The concept of place has traditionally been the other of space (Cresswell 2002). An extensive body of scholarship has focused on drawing out, but also challenging the conceptual differentiations of space and place, notably Yi-Fu Tuan (1977, 1979), Edward Relph (1976, 1992), Edward Casey (1997) and Tim Cresswell (2002; 2004).

The notion of a transformation *from* space *to* place typically relays the dominance in Western thought of a positivist, or absolute understanding of space, over its philosophical interpretations. When space is understood through a positivist lens it is absolute, general, and universal, and by distinction place becomes specific, descriptive, limited, and local. Put another way, space is understood as empty—a container *for* social action—while place is viewed as the materialisation of social organisation and practices, as well as the embodiment of affective experience. In the discipline of geography interpreting the concept of place as that which supersedes the notion of location served to define the split between positivist and humanistic geography (Cresswell 2002). For humanist geographers where location is seen as an abstract point in abstract space, place by contrast is viewed as a richer as it attends to the production and sites of individual, social, and cultural meaning. Place is a territory of meaning. This follows the humanistic geographer Tuan's line of reasoning that "[p]lace…has more substance that the word location suggests: it is a unique entity…it has a history and meaning" (1979, p.387).

For computer science and related disciplines, the distinction between space and place has informed approaches to conceptualising the relationship between computing technologies and practice (Dourish 2006). In early research into collaborative computational environments, Harrison and Dourish (1996) argue against the absolute/affective division of space and place to argue that the action and interaction of the everyday physical world is a poor mirror for thinking through the affordances of a virtually hybrid space. Rather than spatializing these interactions, they argued that conceptualising the hybrid space of virtual interaction in terms of a sense of *place*, offered greater insight. Where space is seen as rooted in the physicality of the environment—the empirical disposition of things in a Cartesian grid—place is regarded as *more* than space; "…a space with something added—social meaning, convention, cultural understandings…" (Harrison and Dourish 1996, p.70). This is not to say that the spatial characteristics are of little import to these researchers, however their chief concern is what happens in space (behaviours and interactions), and it is this that is argued to constitute a 'sense of place' and thereby a cultural phenomenon (Harrison and Dourish 1996, p.71). From this perspective space and place can also be distinguished as inanimate and animate.

In later writing, Dourish (2006) and Brewer and Dourish (2008) outline an alternate approach to the space/place distinction that sees space and place as both socially produced through different practices. This interpretation gives particular emphasis to place in terms of difference and distinction, whereas space is understood as the linkages between our experience of places, the structuring of experience (Brewer and Dourish 2008, p.3). Put another way, space is understood as produced dynamically through movement. This interpretation underlies a fundamental argument that seeks to validate mobile technologies as significantly implicated in the production of space and spatial experience. This positions the built environment as a space that is also the product of social relations. When the city is described as a technology in itself, this points to how technologies are preceded by, or can be considered as the outcome of, prior forms of social practice. This echoes Deleuze (1992) who argues that "[t]ypes of machines are easily matched with each type of society—not that machines are determining, but because they express those social forms capable of generating them and using them" (p.6).

In de Certeau's (1984) interpretation, "*space is a practiced place*" (p.117), which suggests that the way people move through the built environment, their habits and routines, produce space. de Certeau further articulates two "symbolic and anthropological languages of space" as the itinerary (how you go/move), and the map (organised space). This approach centralises movement to the production of space and the construction of meaning. By extension, the new ways of moving and of mobility that are facilitated through mobile technology practices are reasoned to collectively influence how perceptions of space are constructed. Brewer and Dourish (2008) argue drawing focus to space as that which is constructed through movement productively moves away from positivist interpretations of space that see it as an inert container of social action and allows HCI designers to better address how to "turn spaces into places" (2008, p.12).

7.10 Mobilised space

Building on the concept of hertzian space, Mitchell (2003) described "[e]very point on the surface of the earth [as] part of the Hertzian landscape—the product of innumerable transmissions and of the reflections and obstructions of those transmissions" (2003,

p.55). However, in elaborating, Mitchell argues that what is critical to animating contemporary socio-spatial and technical relations is the condition of mobility.

> *"…where networks go wireless, they mobilize activities that had been tied to fixed locations and open up ways of reactivating urban public space; the home entertainment center remerges as the Walkman, the home telephone as the cellphone, and the computer as the laptop" (Mitchell 2003, p.158).*

That mobility figures significantly in the transformation of space is underscored by much scholarly work, as well as the "mobilities paradigm" more generally (Sheller and Urry 2003, 2006b). The twentieth century saw many upward trends in mobility, from the movement of people and objects, to digital information. These mobility trends run counter to the dystopic visions associated with ICTs that predicted an increasingly sedentary lifestyle and detached experience of the built environment (Virilio 1989). Increasing speed and access to digital information has paralleled the frequency and distance of which people now travel. Since 2004, domestic and global air travel has increased from 1.8 billion to 3 billion travellers per year[2], while at the same time global internet access has surged towards 1 billion users; a figure that represents a growth rate more rapid than any previous technology. Accordingly, sociologists Mimi Sheller and John Urry have declared that in increasingly complex and contingent ways "[a]ll the world seems to be on the move" (2006a, p. 207).

For Sheller and Urry (2003, 2006a) mobilities are central to the conceptualisation of hybrid systems, and it is from this perspective that they adopt Sarah Whatmore's (2002) notion of 'hybrid geographies', to describe "hybrid systems, 'materialities and mobilities', that combine, objects, technologies, and socialities" (2006a, p.214). In this way, mobility theory more broadly takes account of the complex relationships between material (corporeal, objects) and immaterial (data, information) movements, and conditions of fixity (location) and fluidity (time). And in ways similar to these techno-centric hybrid space theories, the mobilities perspective is also argued to problematise established notions of space and scale as well as "existing linear assumptions about temporality and time" (Sheller and Urry 2006b, p.214). Methodologically, mobility

[2] The World Bank reports data for "Air passengers carried include both domestic and international aircraft passengers of air carriers registered in the country". <http://data.worldbank.org/indicator/IS.AIR.PSGR/countries?display=graph>Last viewed October 2014.

theory shifts the subject and scope of study from specific technologies and static geographical places to networks of relationality, and thereby to the space in-between. This approach eschews both physical and technological determinism, by alternatively locating the production of meanings in the nature of the space of interactions *between* humans, nonhumans, and places.

Not unsurprisingly, the concept of mobility is central to geographer Nigel Thrift's (2004; 2010) theorisation of "movement-space" (2010, p.6-7). This theory argues that while the Euclidean model of numbered and angled space served initially to chart geographic (static) space by placing a "grid over the world", the digital information age has heralded the second order impact of Euclidean calculation. Thrift mobilises the Euclidean grid and recasts it as co-constitutive and dynamic, and thereby indeterminate. In this sense, the tracking of movement is continually produced and reconfigured in relation to the predefined first-order grid. From this perspective the movement of digital information and particularly the "new practices of organising, analysis, displaying, storing and communicating information" has brought about a transformation in the production of space (2010, p. 6).

Thirft argues, that what began as epistemic shift—a change in the nature of the information system—has transmuted into an ontological one. The effects of this shift he argues is a world of 'movement-space', but more than this he suggests is the reconditioning of the very ways of being-in-the-world through manifold ranges of movement. This describes a new space of thinking, and a sense of space that assumes a "moving point of view", that is nomadologic, rather than monadologic. Here static representations become subordinated to flow as the "nomadologic of movement becomes the natural order of thought" (Thrift 2004, p.590).

Mobility is fundamental to contemporary conceptions of hybrid space. For de Souza e Silva "[h]ybrid spaces are mobile places, created by the constant movement of users who carry portable devices continuously connected to the Internet and to others" (2006, p.262). Elsewhere Farman (2012a) argues that mobile digital technologies enable mobilities to be practiced in new ways, and this constitutes the "emergence of mobility through mobile computing" (p.11). For Eric Kluitenberg (2006), the digital media enabled through ICTs mobilises social and political activities and subsequently

reconfigures the public body (2006, p.8). In citing the centrality of mobile digital technologies to activities such as Flashmobs, but also a number of politically motivated movements such as Reclaim the Streets, Kluitenberg argues that "traditional space" had thus been rendered unstable, uneven and subject to constant change and had produced a 'new' type of hybrid space.

The mobility paradigm draws upon and emphasises what previous writers and scholars such as Simmel (2005), Benjamin (1968, 2002), de Certeau (1984), Bergson (1965), Gibson (1979), Giddens (1991), Ingold (2011), and Virilio (1993) each well understood, that the mobility and motility of the body significantly structures the gaze and thus the perceptions of space and time. As Tim Ingold succinctly states "we know as we go" (2011, p. 229). Furthermore, he notes that this process is never complete as the "knowledge of the environment undergoes continuous formation in the very course of [our] moving about in it" (Ingold 2011, 230). Movement and speed are structuring principles that determine the nature of experience in and of the world. Given this, as Cresswell argues, "movement is rarely just movement; it carries with it the burden of meaning" (2006, p.6).

From this perspective as ways of moving inform ways of knowing and understanding space and time, it is argued that with each new technology of movement space and time are thus transformed. For example, as a primary early twentieth century technology of movement, the automobile significantly influenced city planning and re-shaped the urban morphology, as well as shifting the perceptual relationships between the moving object and the urban landscape. Similarly, the railroad is described by Schivelbusch (1986) as a movement technology of the nineteenth century that transformed people's space-time perceptions and socio-spatial relations.

In one sense, both the acceleration, but also the regularity of movement (such as timetabling) are argued to have altered perceptual understandings of distance, space, and time, in ways that enact a 'time-space compression' (Harvey 1989). On the other hand, Giddens (1991) describes the contemporary practices of movement as producing 'stretched' relationships between the local and the global that create a 'timespace distanciation' (pp. 63-65). For Virilio, the question of transformation through new technologies of movement is undoubtable, yet what is more significant is the question

of what is lost, what is erased when "speed distance obliterates the notion of physical dimension" (2002, p.451)?

7.11 Mobilising transformation

In the twenty-first century, the mobile computing interface has become the dominant platform for deploying digital information services, heralding in new modes of mobility through computing. This constitutes not only significant technological progress, but also a change in our expectations around the roles of computing in everyday life and "a transformation in social and cultural practice" (Dourish 2006, p.2). By extension it is reasoned that as social and cultural practices have shifted, that a profound transformation of 'space' has occurred. Yet, claims to spatial transformation are contingent on the ways the term space is deployed. The 'space' that a HCI researcher or sociologist describes may not necessarily align to the ways it is understood in the built environment disciplines of architecture and urban design. Accordingly, this chapter has examined how the notion of space is depolyed in a diverse range of discourse from architecture and urban studies, human geography, communications and media studies, HCI and urban informatics, to explore the implications of digital-urban interfaces as the complication of normative 'spatial' dichotomies of real/virtual, material/digital, public/private, and physical/cyber as evidence of urban transformation.

The contemporary theories of code/space, hertzian space, hybrid geographies, hybrid space, recombinant space, mixed-space, augmented space, and netspace examined in this chapter each seek to explain urban socio-spatial transformations through the lens of ICTs and mICTs. These theories operate at a range of 'spatial' scopes and scales. For example Castells' (2004; 2009) space of flows describes the shifting economic power structures associated with large-scale globally networked information and quantifiable urban-scale socio-spatial change, while de Souza e Silva's (2006) hybrid space speaks to the socio-spatial implications of networked information at the scale of the mobile device user, and Manovich's (2006, 2013) augmented space similarly refers to the user's experience of urban public space through the consumption and production of networked information, or new media, via digital screens such as the mobile interface.

These hybrid techno-urban theorisations accord with the notion of liminality in that they describe disruptions to normative understandings and serve to reveal otherwise

unknowable conditions. In so doing, they offer important ways to understand the implications of mobile technology practices in relation to urban public space, and of the various ways that ICT systems are increasingly invested with power through mobile networked technologies. Yet, problematically hybrid and augmented spaces describe fundamentally localized, personal, and ephemeral spatialities of mobile device engagement and new media experience. Access to, and/or immersion in these spaces is to a large extent voluntary, user-determined, and intermittent. The possibility to opt-in and out of hybrid or augmented states is discordant with the notion of liminality as a process of a managed and structured change that results in a significant transformation in status and/or understanding. From this perspective, the theories of hertzian, hybrid, recombinant, mixed, augmented, and netspace are not outcomes of a process of urban transformation per se, but rather evidence its revealing, and in this way mobile technology practices are argued here to best resemble liminal triggers.

The theories of hertzian, hybrid, recombinant, mixed, augmented, and netspace are not general claims to transformation in the manner of Lefebvre's epoch-defining notion of space, rather they make specific claims about, and thereby privilege, key technological processes or technical attributes, including software and code, the mobile computing interface, and new media. From a mobilities studies perspective Thrift (2010) argues that what begins as an epistemic shift, that is, a change in the production, flow, and pace of information and knowledge, is that which ultimately transmutes into an ontological one. More generally, this suggests that contemporary mobilised lives are transformative as they lead to new spaces of thinking that consequently translate to new ways of being-in-the-world. Nonetheless, the notion of liminality points towards the ways that, from these highly privileged spatial perspectives, the transformative implications of mobile technology practices are difficult to substantiate.

Finally, the notion of liminality in this chapter operates to call into question the efficacy of hybrid spatialities that, as significant tools of representation and rhetoric, ultimately associate mobile technology practices with modes of ambivalence. After all, hybrid spatial theorisations do not really abandon or remove binary constructions, in fact they throw them into relief. By definition, hybridity describes the interaction of various discrete and distinctive conditions. The mobile interface is positioned as the primary site in which the conceptually distinct conditions of the real and the digital are brought into

closer relationship. Yet hybrid space theorisations also do the important job of validating the ways that (mobile) technology practices are not simply those that take place in space, but rather are implicated in its very production. That is, where cyberspace suffered from the pejorative assumptions it harboured an unseen and thus insidious arm of control, domination and power, hybrid space normalises the relationships between technology, people and urban public space. Hybrid spaces flatten hierarchies and position the material and the immaterial, and human and technological actors side-by-side and in dialogue. In so-doing, and in assigning to technologies the status of 'everyday', this gives them agency but only insofar as the rhetoric of networks, assemblages and so-on allow, that is, without hierarchy or contingency. Seen through the lens of the notion of liminality, the spatial theorisations examined here describe, not the outcome of transformation from one state to another, but rather, and as in the liminal phase, constituent elements or conditions held in a—potentially precarious and vulnerable—state of (animated) suspension.

Chapter 8: Conclusion

"There can be no easy conclusions…to formalize something that is in formation. What I have tried to suggest is that a new world is hoving into view which cannot be encompassed by old ideas of sociality" (Thrift 2014, p. 18).

This thesis constructs a critique of claims that mobile technology practices have transformed urban public space by unpacking and examining a number of underlying assumptions and ideals that connect to key conceptual frameworks as well as disciplinary biases. In recasting these claims through the lens of liminal theory, initially drawn from observations of tribal ritual by anthropologist Victor Turner (1974a, 1974b, 1977a, 1977b, 1982, 1985), a theory that has much to say on the concept and processes of transformation, this thesis offers an alternate perspective on the relationships between mobile technology practices and urban public space. As chapter 2 sets out, the application of liminal theory is demonstrably extensible well beyond tribal ritual contexts. For this thesis, as liminal theory offers a processual view of transformation, it has thus provided a structured way to examine the premises of claims to transformation.

According to Turner's theory, liminal transformation typically involves a tripartite process that includes three stages or phases. In the first, the subject is separated, removed, or displaced from its foundational moorings, in the second, which is the intermediate and anti-structural 'liminal' phase, common sense understandings have been removed and the subject or situation is stateless or ambiguous and reflective in ways that are charged with both risk and potentiality. In the third and post-liminal phase of re-aggregation, 'normality' is restored, albeit in ways that reinstate the subject or situation as transformed in some way. While liminality in the tribal ritual context was originally described in the early twentieth century by ethnologist Arnold van Gennep, it was Turner who identified and theorised the significance of the middle 'liminal' phase in the transformational process. This liminal phase is significant to this thesis for two key reasons. Firstly, as opposed to conceptualising transformation as states of before and after, liminal theory introduces a critical 'other' space, a liminal space of reflection in which to cast the research query in an alternate light. Secondly, and relatedly, while the liminal phase or space is commonly characterised in terms of notions of in-between-ness, ambiguity, and creativity, it also exhibits a distinctly Janus-faced quality. That is, the liminal phase negotiates between opposing tensions and is in this way a dialectical space.

As a state, condition, or space where prior norms and common-sense understandings are displaced and/or removed, it is argued that the seeds of change and transformation are cultivated in the liminal phase—thereby characterising liminality as a space of great

potential and creativity. Yet equally, as an anti-structural borderland where subjects "elude or slip through the network of classifications that normally locate states and positions in cultural space" (Turner 1969, p. 95), the liminal phase carries intense risk. When order is temporarily removed, reversed or suspended, an element of danger is introduced. In liminality there is susceptibility to deceit, trickery and coercion, and thus the chance of being trapped in an indefinite state of in-between-ness and thus ambiguity.

Many contemporary interpretations of liminal theory lend greater emphasis to liminality's anti-structural characteristics of in-between-ness, ambiguity, and creative potential, and pay far less attention to its slippery and divisive nature as articulated by the archetypal liminal personae of the "trickster figure" (Babcock-Abrahams 1975; Horvarth 1998; Thomassen 2009). In this sense, a great deal of scholarly work reflects positive interpretations of liminality, and subsequently liminality has often been put to work in the service of the rejection of absolutism and as a way to challenge extant, fixed, and closed definitions, static limits, and traditional boundaries. Subsequently, liminal theory has become a popular champion for diversity, divergence, transgression, ambiguity, and hybrid conditions, and has found frequent use as a conceptual tool to advocate for, and give representation to, oppressed or marginal cultures.

In this thesis, liminal theory is taken up in ways that call into question the nature of the so-called transformation of urban public space in relation to mobile technology practices. A number of scales of liminal thinking are embodied in this thesis in implicit and explicit ways. In chapter 1 the research problem outlines the ways mobile technology practices are associated with notions of urban transformation. Chapter 2 introduces liminal theory as a way to unfold the notion of transformation itself and through which key and overlapping foci of the selected discourses, namely notions of public space and technology are later examined. Chapter 3 and chapter 4 give focus to elucidating varying disciplinary and definitional frameworks to strip away common sense or normative understandings of terms such as public and private space, and technology. The critique of the transformative force of mobile technology practices is established in chapter 5 and chapter 6 where selected discourses from architecture, urbanism, the social, cultural and computer sciences, as well as communications and media studies that have researched earlier mobile communications studies to more

recent examples of mobile location-aware practices, including a more detailed exploration of mobile interpretive projects, are examined. Liminal thinking is brought to bear on these selected discourses premises of transformation in relation to mobile technology practices and urban public space.

Applying the notion of liminality to think through the interrelationships between mobile technology practices and urban public space necessarily directs the focus of examination towards questions of transformation. Where Turner's liminal theory understands transformation in the processual sense, the nature of inquiry extends to not only how and by what evidence transformation of urban public space can be reasoned, but also, at what liminal stage of transformation does this relate and what might this portend? The question of what has been transformed has been approached, not by seeking evidence of physio-material-spatial transformation in the built environment—or its absence—as might typically be expected of a scholar from within the architectural tradition, but rather by considering in what ways this so-called transformation is made visible in and through a range of discourse. This speaks to the ways the perception of transformation is inextricably tied to disciplinary predispositions on the role and place of technology and the notion of 'publicness' in the twenty-first century. This approach has entailed reviewing a wide-range of discourse and examining its various theories and frameworks of thinking.

This thesis accepts that mobile technology practices are influencing a wide-range of conditions—in both a positive and negative sense—from social practices, workplace organisation, to ways of moving through urban public space, and it offers that mobile technology practices can be alternately conceptualised as liminal triggers. To cast mobile technology practices as liminal triggers comes up against the question of applying concepts from liminal theory—a theory that originated within a tribal ritual context—to contemporary Western conditions. For Turner (1974) the concept of the 'liminoid' represents his main attempt to resolve liminality's extension from tribal ritual to contemporary conditions, and namely, post-industrial modern Western practices. The liminoid describes ritual-like instances that do not progress to the final stage of re-aggregation that is characteristic of a liminal transformation. Turner further argued that the liminoid could be applied to contemporary leisure, sport, or art practices as they could be conceptualised as spaces apart from everyday life that are freely entered into

and out of on a sometimes frequent, yet unstructured basis. Where mobile technology practices are seen as 'user-determined', and thus optional, as well as separate to societal or institutional directives this suggests they might alternately be interpreted as 'liminoidal'. Certainly, when mobile technology practices, and particularly geo-locative media practices, were the purview of a niche group of artists and software developers who experimented with their subversive possibilities, they aligned more closely to Turner's liminoid. The liminoid concept requires an articulated divide between leisure, play, and work contexts, it's assignation demands that certain practices stand apart from, and do not simply invert, but rather subvert, overarching social and cultural frameworks. Yet, as mobile technology practices have popularly assumed the status of ubiquitous, pervasive, and 'everyday', this brings them far closer to a state of normality. Furthermore, as mobile technology practices arguably muddy the distinctions between work, leisure, and personal spaces, it can be difficult to discern how they stand apart from everyday life, as per Turner's orderly interpretation of structural and anti-structural conditions in liminality and the liminoid.

In other ways, mobile technology practices can be argued to be transformative in the liminal sense in the ways they function as mechanisms to 'manage' the user's relationship to urban public space (de Souza e Silva 2012; de Souza e Silva and Frith 2012). While in one sense this suggests ways to empower the user, in the ways mobile technology practices are *purposefully* engineered and designed to intervene in and 'transform' the sociocultural conditions of everyday life, they can also be understood as mechanisms, and indeed extensions of larger societal or institutional structures, to purposefully induce a liminal state and to disrupt the status quo. Yet, elsewhere it is argued that mobile technology practices' *leitmotif*—its recurrent role—is to affect and enhance "our negotiation and engagement with space and place" which can be taken to imply, rather than disruption, the general maintenance and reinforcement of extant conditions (Wilken 2008, p.39). This accords with Deleuze's (1992) view on the role of contemporary digital technologies more broadly, as those that carry out and embody the social logic they are already a part of. This also concurs with Elliot and Urry's (2010) perspective on cultural assemblages where they argue that "humans are nothing without such [technological] objects organised into various systems to augment the otherwise puny powers of individual human subjects" (p.15).

In this way, the range of discourse on mobile technology practices and the so-called transformation of urban public space, finds two divergent narratives working towards a similar long-standing socio-spatial goal: order. On the one hand, mobile technology practices are argued to challenge normative concepts such as the dichotomies of public/private, real/virtual, immaterial/material space. On the other hand, mobile technology practices are argued to offer new ways to optimise, augment, extend, enhance, enliven and enrich the experience of urban public space, and in short, to restore and repatriate its publicness. These narratives are told through examples of mobile location-aware practices under the key themes of social capital and community building, political participation and engagement, interpretation, place-making and place-attachment. In reconceptualising these claims through a liminal/liminoid lens, the question becomes not whether transformation is evident, but at what stages of liminal transformation might these claims align to.

The power of liminal transformation, and that which distinguishes it from the liminoid, lies in its processual transience. Transformation in liminality is brought about by the re-working of extant understandings during the middle liminal phase of reflection and scrutiny. Significantly, and from Turner's perspective, this phase is only ever temporary as the goal is to reinstitute social order, and a reinstate a sort-of return to normality in the third and final phase. Yet, the roots of liminal transformation lie chiefly in this middle liminal phase, and while physical-material change may occur, the operative action is in the temporary destabilisation of conceptual frameworks and societal norms, that is, in the unsettling of any epistemic certainties. From this perspective, it can be reasoned that mobile technology practices are liminal-esque; that they are capable of triggering new ways of seeing. This locates the consequences of mobile technology practices firmly in the realm of the liminal, where, as the process of transformation has not yet reached its conclusion, opportunity and risk are present in equal measure.

8.1 The when-ness of transformation

This thesis has called into question contemporary technourban imaginaries and how the narratives that connect mobile technology practices to the transformation of urban public space are constructed and reasoned. In the mainstream media and academic publications alike, notions of transformation in relation to mobile technology practices

are often underscored by statistics that indicate mobile computing has become the dominant platform for deploying information services in the twenty-first century. Smartphone ownership statistics are taken as evidence of their 'pervasiveness', the arrival of Weiser's ubiquitous computing vision, as well as mobile computing's more general cultural impact. That, since 2011 in Australia alone the proportion of adults owning a smartphone has risen from 37 percent to 79 percent in 2015,[1] is a statistic that suggests not only a technical and commercial feat, but also indicates a rapid and significant shift in people's expectations and use of computing in everyday life. The recent pervasiveness, ubiquity, or everydayness of mobile technology practices is further qualified by statistics on telecommunications provider plans, data-downloads, and apps downloads. In this way, usage statistics often underpin claims to the everydayness of mobile technology practices and shifts in social and cultural practices towards a digital culture (Dourish 2006; Leach 2002a; Picon 2010).

Others argues that mobile computing and mobile technology practices have heralding in a paradigm shift; an alteration in the worldview, as well as existential notions of being (Greenfield 2006; Farman 2012a; Thrift 2004, 2010, 2015). Claims to change, transition and transformation, and its significance, are often so broad that they are seldom disputed. Certainly, the mobilisation of computing constitutes a significant shift in how people engage with computing from an interaction perspective as well as in terms of the increased and varied roles computational processes (i.e. software and code) now play in everyday practices. Yet, these shifts are not wholly coincident with technical developments, as for example the launch of the Apple iPhone on January 9, 2007 that is said to have heralded in a 'smart' era. As a range of scholars' attest, this can equally be contextualised in terms of broader cultural shifts that have been in formation for some time. For example, in the case of Virilio's theorisation (1994), the mobile computing interface may well represent the final dromological instalment and the culmination of the progressive development of speed-machines, including from the Renaissance onwards, technologies such as the telescope, the telegraph, air travel, the high-speed train, and telecommunication.

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[1] <http://landing.deloitte.com.au/rs/761-IBL-328/images/deloitte-au-tmt-mobile-consumer-survey-2015-291015.pdf> Last viewed December 2016.

Similarly, for scholars such as Thrift (2004; 2010) mobile computing represents a convergence of movement and numbers, and a fetishism of calculation that is not necessarily recent, but rather began with the initial application of Euclidean calculation as a model of numbered and angled space to chart geographic (static) space. Thrift argues that the Euclidean model placed a "grid over the world" that has only recently become dynamically re-worked through computational methods that facilitate the calculation and tracking of the movement of objects, people, and information to produce a perceptually mobile space (2010 p.6-7). If we are to follow Heidegger (1977), or indeed Nietzsche, who argue that the underlying logic of technology is not 'technological' but rather accords with humankind's incessant drive to get everything under control and to impose order on all things, then mobile computing and mobile technology practices merely represent the most recent practice in the ordering of everything.

Accepting the axiom that new technologies beget new times and new spaces and problematising the when-ness of transformation goes some way toward critiquing the magnitude of transformative force that can be attributed to mobile technology practices. Yet, while this thesis has sought to question claims to transformation, and more specifically the propensity to elevate mobile technology practices as the primary affecting agent in the manner by which we experience, perceive, and imagine urban public space, the object has not been to deny their significance. Rather, through a liminal lens, this thesis has unfolded the conceptual constructions that underlie claims that mobile technology practices have catalysed the transformation of urban public space.

Chapter 3 addressed the concept of urban public space and it's multiple and sometimes conflicting understandings. Most obviously, the notion of public space does not always connote a physical, material, and geographical area as those in the built environment traditions might typically assume. As Deutsche (1996) argues, while physical urban sites such as parks, urban squares, streets or cities *can* be public spaces they are not always self-evidently public nor are they the only public spaces. Public space can refer to a geographic location, and it can be a typology of material-physical attributes, but it is also a term that carries strong symbolic and ideological baggage such as the abstract notions of civility, polity, democracy, and human rights. In a Western context, and as is

undertaken in this thesis, affixing the term 'urban' to the phrase public space gestures to a physicality or 'site', but this does little to cleave it from the abstract expectations of civic practices, political culture, and in short, the democratic ideals that are often conflated with the physical. So it follows that a dominant way that mobile technology practices are argued to transform urban public space centres around the maintenance, and in many cases, the restoration of both classical and dramaturgical models of public space (Weintraub 1997).

In the classical model of public space, otherwise known as the political/civic perspective, the public is seen as a political community and citizenry as distinct from the private, which is seen as the realm of both the market and municipal/state administration. Alternatively, in the dramaturgical model the public describes a realm of sociability that is deemed to be primarily played out in people's appearances and interactions in urban public space. The reading of public space as a significant realm of sociability is often enfolded into the classic model and civic perspective resulting in a hybrid interpretation that understands the social and political characteristics of public space as interrelated and mutually constitutive.

From this perspective, numerous studies claim that mobile technology practices have afforded on the one hand, new ways to build sociality and community, and on the other, new ways to increase civic attentiveness and political participation. For example, Gergen (2010) refers to mobile technology practices as inciting "transformations in communal life" resulting in a new "floating world" of communal restoration (p.15-17). The expectation that mobile technology practices can optimise or dial-up the publicness of urban public space aligns more broadly to a dominant narrative of transformation told in terms of restoration and repatriation. This narrative is responsive to prior discourses in two key ways. Firstly, this concerns the acceptance of the postmodern position on the degradation and loss of urban public space in for example Deshpande's (2016) account, and secondly this concerns how scholars have sought to disprove many earlier studies of mobile communications that pointed to people's decreased situational awareness and social interaction (de Souza e Silva 2012). In terms of social and political activity, a common perspective holds that plural and distributed sites of civic and political formation through online platforms has meant urban public space has become of "secondary importance" (Amin 2010, p.6).

More generally, mobile technology practices have been strongly associated with the so-called virtues of 'participatory culture', 'interactivity', 'citizen-led engagement', and 'citizen-empowerment' (de Lange and De Waal 2013; Foth et al. 2011; Townsend 2014; Houghton et al. 2015; Ratti 2016). The general contention is that given the mobile computing interface, namely the smartphone, has become the dominant platform for deploying information services, it can thereby be employed to enhance engagement with and between citizens, cities, and spaces; mobile technology practices can connect and engage with citizens in a "hyper-local way to re-create, enliven, and activate space" (Houghton et al. 2015, p. 4). Yet, the concept of participation has numerous interpretations. In a civic sense, participation can refer to social engagement for community-building and the general public good, and in a political sense participation can refer to the exercise of Western democracy. Relatedly, the concept of "networked publics" (Varnelis 2012) seeks to encapsulate how the nature of participation and engagement has changed through the ways people are networked and mobilised through mobile technology practices. This refers to socio-spatial organisation as well as the coming together of political solidarities online that can spill into 'participation' in physical urban public spaces, of which the Umbrella Movement in Hong Kong in 2014 serves as a recent and prominent example (Lee and Chan 2016).

It has been widely argued that mobile technology practices present significant opportunities to enhance citizen participation in ways that correlate with the ideals that underscore traditional notions of urban public space. Yet, recent events such as the Umbrella Movement not only point to the ways mobile technology practice complicate traditional modes of political and democratic 'participation' but also the ways their significance in social change can be overestimated. As studies of the Umbrella Movement indicate, the notion of being a participant was not confined to spatial presence, but rather extended to multiple levels of engagement afforded through digital technology platforms. While many studies have explored how large-scale political movements such as Occupy and the Arab Spring were organised through various modes of digitally networked connectivity, Lee and Chan (2016) argue that few studies have mapped how participation plays out in variegated ways in a combination of online and offline contexts. Given this, Lee and Chan's study more specifically interrogates the range of 'participations' that took place *in situ* and/or through various digital media activities, for varying lengths and frequencies, over the course of the Umbrella

Movement, to illuminate the "misjudgement about the significance of digital media activities in social movements" (2015, p.6).

The notion of 'misjudging' or making assumptions about the significance of digital technologies is argued here to extend to a wide range of claims about mobile technology practices. Mobile technology practices are positioned as new opportunities to augment the 'publicness' of public space, yet these visions often overlook the varying degrees, types, and extent of such practices, as well as their significant constraints, that can include issues with data plans, battery charge, network disruptions, climatic conditions and so on. Instead, statistics that describe mobile ownership, internet access, app installs, and download size are often a stand-in for more specific studies of activities and user-profiles. Where studies do refer to specific mobile technology practices and feature survey and interview analysis, participant numbers are often less than 30 people.[2] In this way, claims to the transformative impact of mobile technology practices can conflate potentiality with actuality.

In general, there remains an idealised vision of the ways that mobile technology practices can transform the built environment by (re)storing the 'right to the city' that is in practice far more complicated. This is tellingly reflected in a recent example in New York where free Wi-Fi was made available at LinkNYC kiosks. The unanticipated uses of these kiosks bought private activities into public spaces in ways that prompted numerous "quality-of life" complaints as homeless people allegedly monopolised them to charge their mobile devices, and others used them to stream 'insalubrious' content to their devices.[3] In this sense, the range of behaviours and experiences of urban public space made possible through mobile technology practices were not necessarily aligned to what is deemed socially acceptable in public, nor to improving an overall quality-of-life.

This example does however point to the complication—in the more pejorative use to the term—of *traditional* understandings of what it means to be in 'public'. It indeed reflects

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[2] c.f. Liao and Humphrey's more recent study of the use of the AR platform *Layar* that features 12 participants, yet does point out the difficulties of such research, including that a large number of people uninstall mobile applications shortly after downloading (2015, p.1424-1425).
[3] https://www.theguardian.com/us-news/2016/sep/14/new-york-sidewalk-wifi-homeless-people-porn Last viewed 19 January 2017.

an example of conventionally understood 'private' behaviours playing out in public settings through the affordances of mobile and situated computing. It is also an example of the ways public space can, and following Deutche (1996), should always be a contested space, or a question. While mobile technology practices are argued to blur the boundaries of public/private, real/virtual and material /immaterial conditions, more accurately, and as per the Kiosk example, such testing of the limits serves equally to reiterate their distinctions. Furthermore, extending a sense of personal space into a public space is not a new behaviour. As pointed out in chapter 5 mobile technology practices represent new ways to realise long-standing social tendencies of civil inattention and withdrawal (Goffman 1963). What is different are the ways such practices are reified in scholarly contexts and held to example the so-called blurring of public and private space. For built environment scholars who were lamenting the loss of public space in the 1980s, the blurring of the boundaries of public and private space was principally a matter of economics and ownership. Put simply, privately owned and managed public space represented the social and cultural threat of ever more spaces in which people were subject to capitalist domination. In the more recent scholarship on mobile technology practices, the complicating of public/private boundaries is more often told in the positive sense of transcending the geographical limits of urban public space, of bringing the global into the local and vice versa, extending the personal into the public, and as thus opportunities for its optimisation.

It is under the theme of optimisation that the discourse on mobile technology practices also extends into the phenomenological realm. The variety of ways that location-awareness can now be practised through a mobile computing device is argued to constitute the renewed attention to, and more meaningful engagement with, urban public spaces. This understands the transformation of urban public space in terms of the construction and interpretation of meaning. According to Gordon and de Souza e Silva (2011) mobile location awareness means people are no longer 'limited' by their own individual knowledge of a place, as location-aware technologies and practices transform how people become aware of their location" (p.12). Furthermore, and aligning to the overarching theme of participatory culture, de Souza e Silva (2012) argues that location-aware technologies afford agency to the individual to "read and write locations" (p.119).

The producing and sharing of user-generated information about places through specific LBSN, but also popular social networking platforms such as *Facebook*, is argued to build socio-locational 'familiarity' and thus make urban public space 'more visible' and more meaningful (Lee 2010). Drawing conclusions from case studies of mobile location-aware applications Willis et al. (2010) argue that sharing place-based information transforms places from merely informational into those that "gain[] meaning through social exchange" (p.303). For Gordon and de Souza e Silva (2011) localities gain greater significance through the networked connectivity, and thereby extended global reach, of mobile technology practices. More recently, Willis (2016) has reiterated these claims, arguing that mobile location-aware technology practices such as *Foursquare* "initiate a re-coding of place, moving from map-based and abstract to social and networked" in ways that valorise the meaningfulness of "inbetween places" (2016, p.34-36).

As LBSN and LBGs employ tactics and incentives to 'check-in' to locations, to produce user-generated maps of cities, and to geo-tag images and comments, such practices are argued to bring new and renewed visibility and attentiveness to urban public space. Yet, other studies point to the ways the incentivisation to check-in, geo-tag and generally collect experiences, places events, trips, and events, can be directly at odds with developing notions of discovery and forging stronger connections to and understanding of the built environment (Gazzard 2011). The contemporary compulsion to record and re-tell all facets of lived experience can in this way effect a *deferral* of experience. Elliot and Urry (2010) describe how this alternately encodes the 'meanings' of places and experiences into techno-objects to be " 'withdrawn' for future forms of symbolic elaboration and interpersonal communication" at a later date. (p.6). This speaks to the far less discussed object-ness and screen-ness of the mobile computing interface. Mobile technology practices are (currently) fundamentally screen-based engagements that must in some ways, and even with affordances of AR, necessarily divert attention from a wider context. This is underscored by a recent empirical study by Hatuka and Toch (2014) that explored the public experience of smartphone users. They describe how mobile technology practices affect a "reduction in attention to the environment" and that "emotional attachment to the physical locale…is weak" (p.8). Still, in other ways Hatuka and Tock (2014) reason that while the enhanced activity on smartphones may reduce the users' attention to their surroundings in a situated sense, that mobile

technology practices also afford "new ways of addressing the sensory stimulation of the city" (p.8).

De Souza e Silva claims that "one of the most profound implications of location-aware technology use is a shift in our perception of space" (2012, p.118). The mobile computing interface is popularly argued to constitute the new perceptual equipment by which we can better make sense of our contemporary conditions. Given liminality's anthropological origins, and as the case examples of its interpretation in the disciplines of medicine, psychology, and education set out in chapter 2, liminal theory offers productive ways to think through transformation from the perspective of individual experience. Chapter 6 surveyed a range of case study research and theorisation, complemented by a more specific discussion of mobile interpretive projects that have adopted mobile location-aware applications and augmented reality platforms (AR).

Mobile technology practices more generally are argued to provide opportunities to engage with urban public space in ways that are "more personalised", and thereby "increasingly meaningful" (de Souza e Silva & Frith 2012, pp.197-198). Mobile interpretive projects have provided particularly useful examples to discuss these claims and the so-called transformed perceptions of the built environment. Farman attests that mobile computing affects a transformation *from* space *to* place, as digital information that is contextualised in place can "imbue space with meaning, thus transforming a space by giving it a sense of place" (2012, p.40). Various rhetorical themes are gleaned from surveying this research, including that mobile location-aware technology practices enable a more personalised experience: information tailored to the user's preferences; a more dynamic experience: on-demand information that is also 'real-time', aggregated, and readily updatable; and an interactive and participatory experience: the user's ability to contribute and share information and data (knowingly and unknowingly). In digital media speak the overall experience is thus argued to be 'immersive'. In this way, mobile technology practices are elevated to the role of the primary affecting agent in the manner by which we experience, perceive, and imagine urban public space in the twenty-first century.

Moreover, claims to the optimised experience of urban public space through mobile technology practices are reasoned as a metaphysical transformation of embodiment. In

HCI and communications and media studies scholars argue that mobile technology practices extend sensory perceptions to constitute technological embodiment (Dourish 2001; de Souza e Silva and Sutko 2011; Farman 2012). The phenomenological angle humanises technology in ways that make claims for its many potential applications in everyday life more palatable and normalised. As Hale suggests, in conceptualising technologies as those that augment human sensory systems, this frames technologies "less as a barrier between the body and the world and more as a means to bring the world even closer" (2012, p.516). Yet, it is worth remembering that the technologies that Merleau-Ponty (2002) and Heidegger (1977) refer to in their conceptualisation of embodiment are profoundly different from the personal, mobile, networked digital technologies described here. The technologies that produced embodied relations as described by Merleau-Ponty and Heidegger tend to be mono-functional objects directed at a specific task or sensory amplification and/or correction. Moreover, in comparison to mobile digital technologies, and namely the smartphone, these earlier technologies were relatively inert. One of the key tenets of technological embodiment as theorised by Merleau-Ponty and Heidegger is the technology's perceptual recession into the background, to operate seamlessly such that attention is focused on the sense perception and experience of the activity rather than the technology that it is mediated through.

Technological embodiment has been employed as a key way to change the perception of human-computer relations. A foundational tenet of the ubicomp paradigm sought to find ways for computing to 'withdraw' such that the distinction between the interface and the action becomes indistinguishable. In terms of embedding sensors and actuating technologies into the fabric of the built environment the goal of calm computing finds many examples. Yet, in terms of the mobile computing interface—the smartphone and screen-based devices that are hand-orientated such as Ipads and tablets—while they are arguably far more ubiquitous than other computing technologies, they do not realise Weiser's vision of technological embodiment. The multiple roles and services the smartphone provides and the sheer command of attention and interaction they demand, coupled with their status as valuable and symbolic objects, are directly at odds with initial ubicomp objectives. Weiser (1991) noted that integrating computing into the world did not mean,

> *"just computers that can be carried to the beach, jungle or airport. Even the most powerful notebook computer, with access to a worldwide information network, still focuses attention on a single box…a super laptop is like owning just one very important book" (p.94). .*

Considering these aforementioned points, and from the perspective of thinking through liminality, does the claim to the transformation of urban public space as a more meaningful experience hold from an individual perspective? While it might be reasonable to claim that mobile technology practices influence how meanings of places are constructed or understood from a scholarly perspective, from an individual perspective of experience there are always different degrees, or indeed qualities, of meaning for different people in different contexts or situations and in ways they remain difficult to account for. That it is impossible to experience or understand another person's experience is a central problematic of much phenomenological philosophising and theorising (Kapferer 1986). Edward Bruner notes that "[t]he difficulty with experience…is that we can only experience our own life, what is received by our own consciousness. We can never know completely another's experiences, even though we have many clues…" (1986, p.5).

This key phenomenological problematic is underscored in a number of research studies that have attempted to understand the user behaviour and experience of various mobile apps. Willis et al. (2012) point to the inherent challenges of exploring a "local community's reading, interpretation and inner-knowledge of place" (p.76). What might well be an experience for one smartphone user, is not necessarily a given for others. In this context, it is also necessary to account for what research on specific media through location-aware practices such as that of *Facebook*, *Foursquare* or *Instagram* reflect, being a window on the world of *Facebook*, *Foursquare* or *Instagram* users. That is, while various mobile technology practices might generate easily accessible geo-tagged data on places, this does not necessarily result in revealing an encompassing or useful reality of those places.

If it is difficult to understand individual experience, it is equally difficult to make claims about its meaningfulness. This is an issue that Victor Turner explicitly addressed in his work, noting that "…all human act is impregnated with meaning, and meaning is hard to measure…" (1986, p.33). Meaning-making in Turner's view is a relational

structuring that brings past understandings to bear on and make sense of present affects. The mobile computing interface can certainly be understood to figure in a relational structuring of meaning, however its primacy is less convincing. To further clarify, and drawing from Wilhelm Dilthey, Turner points to a distinction between "experience" as a passive endurance and acceptance of events and "an experience" as something that "stands out" (1986, p.35). These experiences are processual, they involve liminality, and they shock people into searching for meaning. For Turner, experiences that 'stand out' are formative and transformative and function to initiate people and societies into "new lifeways" (1986, p.35). Turner's theorising on the nature of experience and Heidegger's philosophising supports HCI's focus on performance, action and interaction—the space between human-technology relations—as a way to understand the world and its meaning. Yet equally Turner's position suggests that not all action is meaningful or transformational in the *liminal* sense. Furthermore, Heidegger argues that that modern technologies can operate as barriers to the kind of revealing that practice, or action-in-the world, otherwise offers.

As Bruner further points out the conflation of a notion of experience with behaviour. Experience is not necessarily equivalent to behaviour, as this "implies an outsider observer describing someone else's actions…it also implies a standardized routine that one simply goes through. An experience is more personal" (1986, p.5). From this perspective changes in behaviour, as for example accessing information about a place through a mobile interface, thereby do not necessary equate to experiences of meaning-making significance in the liminal sense.

For several scholars within the built environment traditions, urban public space and urban public life are little affected by mobile technology practices. But, even from within this perspective two divergent positions emerge. Firstly, the conservative positions offers that the material-physical attributes, and thus core values, of urban public space have been maintained, and reflect continuity, stability, and sameness, in a manner that allows various scholars as well as regulatory bodies to formulate policies around 'good design' principles (Lang and Marshall 2017).[4] Secondly, the marginally

[4] See Project for public spaces "Ten 10 Principles for Successful Squares" http://www.pps.org/reference/squaresprinciples/

alternate perspective concedes that significant material-physical transformation is pending, that urban public space is on the verge, at the threshold, and at the material limits of its influence (Picon 2015; Thrift 2015).

By definition, to operate within a disciplinary framework is to throw into focus particular subjects and not others. This can be done in ways that obscure or remove the possibility of understanding a wider range of related conditions. While not the focus on this research, a corollary observation this thesis makes is that the built environment traditions' largely physicalist or metric approach to space, as well as the tendency to conceptualise technology in an instrumental sense, has operated to draw rigid boundaries around the space of the discipline. This goes someway to explaining the built environment traditions' indifference to matters of digital culture that extend beyond the practice of design. In the built environment disciplines more generally, when not describing computational tools and methods in design practice, such as for representation, form generation, and digital fabrication, the consideration of computing applications *within* and *for* the built environment is more often associated with the radical and avant-garde groups of the 1960s, and more recently in terms of 'innovative' practices and smart city strategies.

This stands in contrast to the social and cultural sciences, where the impact of digital technologies has been widely exploring in relation to new 'networked' social structures and configurations, and in the computer sciences where rethinking the contexts of computing has affected a 'spatial turn' and the development of still newer fields such as interaction design and urban informatics. For the established disciplines, such as computer science and HCI, bringing together the once distinct conceptual realms of technology, information, and space, has meant shifts in disciplinary approaches, research subjects, methodologies, and theoretical perspectives, including the foundational concept of ubicomp. Further still, as the smartphone has realised a new and dominant context of *mobile* computing—in ways that ubicomp theory did not fully anticipate—speculation on the transformation of physical contexts in relation to new digital informational structures and mobile socio-digital practices has proliferated.

NSW Government Architect, "Better Placed: A design led approach: developing an Architecture and Design Policy for New South Wales", http://wwww.planning.nsw.gov.au/~/media/Files/DPE/Plans-and-policies/draft-nsw-Architecture-and-urban-design-policy-2016-09.ashx

If the conditions of digital culture are so well appreciated and researched in the social and culture sciences and the computer sciences, why should the built environment traditions be encouraged to extend their involvement in this space of technology? Firstly, conceptualising human-computing-environment relations is not new to the built environment traditions. As discussed in chapter 4, urban and architectural projects explored similar ideas when computing first transitioned from a military context into the mainstream and commercial domain. Among the architectural avant-garde in particular, the latent potentialities of technology were taken up in the service of resurrecting and rethinking the architectural discipline. In this way, early computing and communications technologies were enrolled into an ideological project. Yet, a great deal of projects ultimately reflected the aestheticisation of technology rather than its meaningful application. While in some ways this period tarnished architecture's reputation for engaging with emerging technologies, seen from a contemporary perspective the underlying motivations of many of these projects provide a useful counterpoint to the technical opportunism of the ubicomp and smart city paradigms. So, while it is reasonable to assume that more technically-orientated fields are best positioned to deal with digital technologies and their relationships to people and the built environment as Malcolm McCullough asserts (2013), to completely disengage from this space of technology is to exclude the built environment traditions from an advantageous position of critical distance.

8.2 Limits and future research

This thesis has adopted an interdisciplinary method to examine and critique a selected range of discourse that attends to the overlapping foci of urbanism, space, and technology in the context of urban transformation. While the scope of this research has been limited to examining and critiquing the premises of the selected discourse, this has illuminated a significant investment in user-studies research on mobile technology practices from within the social, cultural, and computer sciences, and conversely, a limited contribution from the architectural and discipline. The diversity of mobile technology practices, as evidenced by both the theoretical and empirically-based research studies of mobile LBGs, LBSs, and LBSNs cited in this thesis, can make it difficult to appreciate the contribution that an understanding of these practices might offer to the architectural discipline. Additionally, as the research studies examined in

chapter 5 and chapter 6 reveal, in contrast to the generally accepted claims to the ubiquity and pervasive of smartphone adoption and use, isolated studies of specific mobile location-aware services tend to reflect a niche and somewhat fickle user-group. In other words, the necessary specificity of these studies serves to also undermine claims to the everydayness of these practices and thus to their significance in relation to the experience of urban public space. Furthermore, and given their disciplinary origins, these studies tend to give focus to media-production and/or user-behaviour over more explicit attention the interrelationships between mobile technology practice and urban public space.

While the limitations of existing empirically-based mobile technology practice studies has informed this thesis' critique of more generalised claims to urban transformation, the findings of these studies nonetheless point to compelling evidence of new modes of navigation, decision-making, engagement, and attention within and towards the built environment, as well as new methods by which these practices can be analysed. Questions of meaning-making, symbolism, and place-attachment have become key concerns in both the social sciences and built environment disciplines over the last two decades (Lewicka 2011). As Maria Lewicka (2011) notes in her review of research on place attachment and related terms, while there been an exponential increase in research related to these terms there are few studies that seek to empirically explore what kinds of places people prefer and establish emotional attachment to (p.210). Since Lewicka's survey, and paralleling the meteoric adoption of smartphones, a number of empirically-based user-experience studies of mobile technology practices have been published that touch on the topic of place attachment (Florian and von Humboldt 2014; Humphreys and Liao 2011, 2013; Liao and Humphreys 2015; Licoppe and Fiegac 2015; Schwartz 2015; van den Akker 2015). Similarly, visual cultural studies of locative media, such as those undertaken by Manovich et al. (2014), now offer alternate approaches and new questions around the nature and process of place attachment.

While larger-scale and 'big-data' analytics aim to reveal and predict city-scale socio-spatio-economic trends—advanced as a new urban science by key figures such as Batty (2012, 2013) and Ratti (2011), as "…mobile technology *remakes* attention at street level" (McCullough 2013, p.195, my emphasis), the analysis of mobile technology practices, and of user-generated locative-media data, points to richer ways to understand

the conditions and characteristics of urban public spaces. This represents a range of future research opportunities where the adoption of empirically-driven locative media data analysis methods and user-experience studies of mobile technology practices can be directed to more specifically examine issues of place attachment from an architectural and urban perspective. Affording new levels of access to the ways people 'experience' urban public space can further contribute to re-animating long-standing phenomenologically-driven lines of enquiry.

8.3 Urban liminalities

As a contribution to interdisciplinary thinking, this thesis has synthesized a wide range of research and discourse on mobile technology practices across a variety of themes including social organisation, movement and navigation, and spatial appropriation. It has considered on what basis it can be claimed that mobile technology practices have affected a transformation of urban public space, and further how these claims have been translated to theorisations of space. Particularly, this thesis has explored more closely the arguments that connect mobile location-aware technology practices to the transformation of urban public space in terms of interpretation and meaning-making. In unpacking the assumptions and ideals embedded in this discourse this thesis has sought to critique, but also inform and refigure, how urban public space is conceptualised in a contemporary sense. Research and theorisation that explores the interrelationships between mobile technology practices and urban public space has brought new and alternate perspectives and methodologies to bear on its examination. For the built environment traditions there are many benefits to be gained from engaging in the wider spectrum of digital culture. It is crucial to realize that to operate in and understand these so-called hybrid spaces, traditional barriers have to fall down and leave room for more open-minded approaches. As Aurigi contends "[r]ecombinant" space can only be dealt with by a "recombined" discipline (2008, p.116).

The introduction of new technologies tends to carry a revolutionary impulse. At the beginning of the new millennium mobile digital technologies seemingly offered powerful and new ways of looking at the world, however, what was once a subversive medium, is now the new normal. Mobile technology practices no longer simply offer new ways of looking at urban public space, they actively incite them. Aligned to the so-

called participatory turn, mobile technology practices, in various ways, compel individuals to record, re-tell, and re-distribute the minutiae of their everyday experiences, knowingly and sometimes unknowingly, in ways that produce plural and variegated micro-(hi)stories of the city and of urban public space. Experiences are made and re-made, filtered and curated, and uploaded to the cloud for future reference. With this, urban public spaces have potentially far greater representation in ways that are variously agreeable, conflicting, and contradictory, and to adopt computer parlance, offer variations, versions, and updates. The notion of an update correlates further with notions of liminal transformation, as it does not imply wholesale change, but rather a process of temporary disruption that is revisionary and redressive.

A liminal approach to thinking through transformation opens up to a different set of questions around the experience of urban public space as mediated through mobile technology practices. From the liminal perspective, this thesis argues that mobile technology practices can be conceptualised as liminal triggers, activated by and for some people, but not necessarily others. This challenges claims that elevate mobile technology practices as the primary affecting agent in the experience of the built environment and representations of urban public space. Moreover, this recognises that the conditions of liminality are not necessarily positive, that celebrating ambiguous spatialities, such as the complicating of public/private distinctions and hybridities of space as the recursive interaction of material and immaterial realities, can also suggest a problematic suspension in liminal space where it is no longer possible to proceed to a new state of awareness and understanding, or where such understandings are manipulated in coercive ways. In this reading the transformative potential of mobile technology practices, and of the liminal, are annulled.

To describe mobile technology practices as liminal triggers, acknowledges their epistemic impact; the ways they complicate long-standing dichotomies of spatial order, in a social and experiential sense, from public and private to real and virtual. However, recalling a position argued separately by both Zukin (1991) and Thomassen (2012), the liminal is a critical space that can also be a space-in-crisis. As liminality's productive power lies chiefly in its transience, a more fixed or prolonged sense of liminality can gesture towards obstruction and the collapse of order. This suggests that the technourban imaginary that elevates mobile technology practices as the primary

affecting agent in the experience of urban public space might equally be seen as a guise or a seduction that obscures the continued privatisation of the spaces of cultural production, and in short this suggests not the transformation of urban public space but its ongoing and evolving consumption.

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Appendix A: Publications

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