

The Critical Construction of Geolocational Life

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Abstract

This dissertation is an analysis of the widespread adoption of locative digital media in urban space. Building upon prior phenomenological theories of mobile interfaces and critical theories of technology, I provide an account of the micropolitics of locative media, using *locational literacy* as a key concept for articulating a renewed, and politically and ethically empowered understanding of how locative media play important roles in modern urban experiences.

The thesis proceeds by first contextualizing the idea of locational literacy within locative media studies and mobilities research. I then elaborate the idea of locational literacy by synthesizing phenomenological and critical theories of technology, including Andrew Feenberg's critical constructivist approach (2002) in order to problematize geolocational media as a site of micropolitical struggle.

Then I provide an account and analysis of field data collected through my ethnographic research. Here, I show how geolocational media users come to terms with and organize their values, attitudes, and identities through media technologies, and how both individual technical knowledge and institutional constraints influence their relative access to and effective use of geolocational media. Further on, I describe a user experience study involving mobile phone users, who were surveyed (a) before and (b) after using a geolocation tracking app for a two week period. In this discussion, I show how geolocational awareness is associated with attitudes, values, and opinions about urban life, sustainability and mobile locative devices.

I conclude the dissertation with the claim that the potential for perceptual shifting enabled by geolocational media empowers individuals – albeit somewhat unevenly – in very particular ways. This perceptual shift and sense of empowerment, I argue, can lead to improved forms of community interaction and deliberation, which hinges on an express articulation and acknowledgement of locational media literacy in everyday experience. I also examine how the micropolitical struggles of users with geolocational media signify the potential for broader political change as these technologies become progressively more accurate and granular, and more surveillant and invasive.

Keywords: mobile communication, locative media, digital media literacies, urban studies, critical constructivism

Dedication

For Oscar, whose many wanderings inspired me to worry about where things go when you don't see them anymore.

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List of Acronyms

3G	Third generation mobile cellular networks
4G	Fourth generation mobile cellular networks
ANT	Actor-network theory
AR	Augmented Reality
CRTC	Canadian Radio-television and Telecommunications Commission
CWTA	Canadian Wireless Telecommunications Association
DSL	Digital subscriber line, a group of technologies that provide data exchange over telephone networks
DTES	The Downtown East Side, a neighbourhood in Vancouver
ECUAD	Emily Carr University of Art and Design
GPS	Global Positioning System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications, second generation digital cellular networks
IP	Internet Protocol
LBG	Location Based Games
LBS	Location Based Services
LBSN	Location Based Social Network
LTE	Long Term Evolution mobile cellular networks
MVNO	Mobile Virtual Network Operator
RIM	Research In Motion
SCOT	Social Construction of Technology
SFU	Simon Fraser University

Introduction

In doing my graduate work, I wanted to understand the implications for social change with the use of handheld and portable wireless devices to access the internet and other forms of internetworking, as well as the embedding into the physical environment chips and sensors that connect and annotate the built environment of modern cities in ways that facilitate or shape these emerging practices.

Why did this collection of emerging practices, technologies, and their associated policy implications become interesting to me? A number of circumstances in my personal life at the time I conceived the research come to mind – I became a father, I became a homeowner, I moved into a highly pedestrian-friendly neighborhood of East Vancouver, and (like many affluent North Americans c.2007-2009) I started using smartphones and tablet computers. All of these circumstances put me in an exceptional position to contemplate and adjust my everyday practices of getting around, working, leisure, computing, consuming or producing media, and communicating interpersonally.

As I began to experience urban environs as a father, my perspective changed immensely. I started noticing how buildings, streets, open spaces, modes of transportation, among other infrastructural elements in cities are coded for gender, race, age, ability and social class. The experience of everyday life in cities is fundamentally prefigured by such infrastructural elements, which have political, ethical, and economic codes written into them, just as the "code" of computer hardware and software is inscribed with politics – politics with which users of that technology or infrastructure must contend and struggle (Feenberg 1999; 2002). Carting around an infant or toddler, for instance, demands certain infrastructural accommodations on the part of public transportation vehicles. Strollers are allowed at the front of the bus, but space for them is limited and shared by those using mobility aids and the elderly, with an unofficial and unspoken – and therefore not understood - pecking order.

Because of their priority location at the front of the bus, stroller- and other mobility-aided passengers determine much of the transit experience of others because of this. Most obviously, they are the first to board, and the first to disembark, and they therefore change expectations among all transit users regarding commuting times, they

institute new practices related to the processes of embarking and disembarking (letting the driver know ahead of time which stop they need to get off at).

Lesser known are the issues affecting public transportation use for children who have graduated from their strollers and/or harnesses. Boarding and unboarding are less controversial, as the parent and child must wait in line along with everyone else. But typically, buses are not designed with handles within reach of children, which limits where free-standing children may be situated on a bus. To make things more complex, a parent or guardian is under a legal duty of care to ensure their child is seated or standing at all times safely on a bus, which requires a certain arms-reach proximity that is made impractical by crowded conditions. The pecking order for seating a child while a parent stands can complicate matters, too, putting as it does at times pressure on a strange adult seated next to a child to intervene when a child is at risk of falling or otherwise harming themselves.

Just now, I've been rabbiting on about a lot of anecdotal information that is specific to my own experience with fatherhood and public transportation. This form of knowledge usually emerges from experience, and is highly difficult to predict with user experience studies. These are precisely the kinds of experiences of interest to theorists like Michel de Certeau (1980), who emphasizes the importance of studying everyday practices as the intersection of (infra-)structure and agency, and reading these practices for their political and ethical content. According to de Certeau, strategic (infrastructural) constraints can often be subverted by actors who adopt tactics for negotiating their environments.

What I intend to do with the present study is to investigate the rhythms of the interplay of these tactics and strategic structuring in order to articulate how knowledge of very specific tactical negotiations in specific urban situations comes to form a kind of locational literacy. Though this is tactical in origin, as with the development of vernacular culture and language, some certain practices or phrases persevere, spread, and prevail over time, eventually constituting new constraining structures while other tactics get discarded or modified.

In this dissertation I set out my basic terms of reference by using phenomenology and critical constructivist approaches to studying socio-technical phenomena in urban

settings. In so doing I rely upon and build upon the foundation of a long tradition of research, in several interleaved strands, traced as follows.

Following Michel de Certeau, who proposes that we can "read" cities or apartments like we read books (1980), I propose a theory of locational literacy that equips us with the appropriate tools to read locations effectively and critically. Just as a reader of literature is enriched by understanding the meaning of allusions, or by specific knowledge about the author's reasons for writing certain passages, or even by the reader's understanding of different genres of literature, urban residents develop a locational literacy that variably equips them to effectively do what they desire to do, and also with the tactical efficacy to resist programmes suggested by infrastructural elements like turnstiles.

Of course, other writers besides de Certeau and Lefebvre (1991) have interrogated the city and media within it in various points in the history of ideas upon which my dissertation work builds. From the early philosophical interrogations of modern urban form in the work of Georg Simmel (1950), through Walter Benjamin's (1936) articulation of the flaneur in the early 20th century Paris, through the late 20th century investigations of urban economic flows (notably Harvey [1973], Sassen [1998], and Castells [2000]), the present work also builds upon a long tradition of critical investigation of the city as a site where intellectual inquiry and social upheaval are equally intense. If anything is formally consistent between these prior works and my own research, it is the notion that cities and communicative practices within them are a *perpetually shifting ground*, due to the inherent complexities of dense, heterogeneous metropolitan human settlements. Canadian cities like Vancouver are no exception to this rule (Hutton 1998) but the period under investigation presently (c.2011-2017) was a period of pronounced growth and gentrification for this city, along with increased importance of Vancouver's role in the global economy. My empirical research draws entirely from the Vancouver experience, and thus my dissertation informs this research tradition uniquely in its focus on a medium-sized port-and-resource-exporting city undergoing a radical postindustrial transformation into a world trading center and home for global elites, a very particular experience of the early 21st century for several other cities (Toronto and Berlin, among others), but an experience that, as I will show, is generalizable beyond the immediate situation under study.

Contemporary studies of mobile media and social transformation in urban settings address the current configurations using approaches that are phenomenological (Farman 2012, Dourish & Bell 2011), radically empirical (Gordon & de Souza e Silva 2011) or using a de Certeauian approach (Coyne 2010). Studies of mobile devices (Ling 2003; 2008, Smith & Gow 2006, Ito, Okabe & Matsuda 2005) have adopted ethnographic approaches to mobile phone use to which I am also indebted. Further influences include earlier work on ubiquitous computing (Dourish 2001 and Rheingold 2002), with their visionary explorations of the interplay of networks of things, persons and spaces in both wild (crosswalks, sidewalks) and controlled (laboratory, office) settings. What distinguishes this dissertation from these past studies of mobile media and/or cities is that I adopt an explicit critical constructivist approach, developed initially by Andrew Feenberg. In this light, I describe the mobile re-making of cities in terms where questions of power and politics are brought into the foreground, and these questions expose opportunities for technological intervention and political participation by citizens. By adopting this approach and developing it with respect to my empirical investigations, I hope to demonstrate in a profound way how the technological innovations that are ever present, increasingly ubiquitous, and continually upgraded in modern technocratic societies do not necessarily have to be the way they are advertised or even commonly understood to “be”. New technologies demand our interrogation, and in a world of ubiquitous digital communication (or an “internet of things”, as it is sometimes called), we have a civic and democratic duty to not accept new technological devices and media as they are presented to us. We are duty bound to unpack, question, hack, repurpose, and domesticate these things that are proffered. To do otherwise is to do future generations a massive disservice.

I started out doing user experience research with CPROST, supported in part by a University research grant from Nokia. This research proceeded in two phases in 2005 and again in 2007. In both instances the research team equipped a number of social media enthusiasts with Nokia smartphones for a month of field experimentation, followed by group interviews. These two studies were important in illuminating emergent practices and tendencies among a group of digital media users who otherwise had no access to sophisticated smartphones, which at the time were unavailable in the Canadian cell phone market.

The iPhone was released in Canadian cities for the first time in 2008. At the time

of its introduction, I had transitioned into an administrative role with the Mobile MUSE Network, an advanced technology research and community engagement network funded by the Department of Canadian Heritage to conduct community-based applied research into advanced mobile internetworking technologies for everyday life. During this transitional time, a much larger number of mobile smartphone users and software companies came onto the scene, with a resulting increase in the diversity and range of applications and uses to which these new devices could be put.

Between 2009 and 2011 (the year I began fieldwork for my PhD dissertation), the fundamental premises for the current mobile and wireless internetworking scenes in Canada were laid: in 2009 the Android marketplace opened, the first Android handsets appeared on the Canadian market, and the federal government reallocated significant chunks of wireless spectrum to several new entrants to the wireless marketplace in Canada, making way for new carriers like Wind and Mobilicity; in 2010 the iPad took the Canadian market by storm; the RIM¹ empire began to falter in the face of competition from Google and Apple; and Android became the dominant platform for mobile devices in the Canadian market by 2011.

Following on my ethnographic work for Nokia, I developed my dissertation research around understanding the everyday practices of early adopters of smartphones and tablet computers. My original intention was to look at changed perceptions of urban environments in these users' everyday mobile-mediated experiences, but as I will disclose with this account, transformative impacts of this kind were not observed. Instead, I observed a large number of small, incremental adjustments in thinking and doing with mobiles (echoing Coyne 2010). I also came to realize the importance of class, gender and ethnicity in shaping our interactions with mobile technologies and urban environments. Finally, I came to a re-conceptualization of mobile urban practices and locational literacy as operating in a field with a highly diverse set of tactical opportunities and strategic constraints, reflective of broader sociopolitical structures, such as transportation planning prerogatives, urban design, and the processes of capitalist accumulation in cities, which affect strategic and tactical choices all down the line. For instance, road or rail infrastructure planning influence individual transportation choices (i.e., "is it safe to ride a bike here?"), which variably enables greater smartphone use

1 Research In Motion, a Waterloo, Ontario based company that developed the once dominant Blackberry series of handsets and messaging platform.

without negative consequences like bodily injury or death (driving while texting). Conversely, use of public transportation facilitates more intensive smartphone use, which can influence expectations around interactions with strangers in such places (Bull 2004), setting the stage for new tactics around communicating with those strangers (tapping the shoulder, rather than verbally addressing, for instance, a headphone-wearing bus passenger standing in the aisle when one wishes to move past them). Relatedly, as arose acutely in my ethnographic data, a person's habitual mode of transportation shapes dramatically their knowledge about places like cities; drivers know where the cheap parking is, how to trigger certain advance green lights, which alleyways can function as effective shortcuts, and which ones are habitually clogged with garbage trucks, along with many other examples of tactical know-how.

This dissertation is organized as follows. In Chapter One, I conduct a literature review spanning select works in mobile communication studies (and in particular, locative media studies). Chapter Two extends this work to engage with phenomenological and critical theories of technology, including (especially) Feenberg's critical constructivist approach (which is also influenced by phenomenology, but adds a political and moral perspective to these matters) in order to problematize geolocational media as a site of micropolitical struggle. It is in this Chapter that I also propose a theory of *locational literacy*. Chapter Three describes my mixed-methods ethnographic approach to empirically studying these phenomena. Chapter Four is a detailed account of my ethnographic research designed to illuminate locational literacy, involving a multi-year participant observation study of five individuals who self-identify as early adopters of mobile geolocation apps. Here, I show how geolocational media users organize their values, attitudes, and identities through media technologies, and how both individual knowledge and institutional constraints – both technical and social – influence their relative access to and effective use of geolocational media. Chapter Five describes a user experience study involving 21 trip-tracking app users, who were surveyed (a) before and (b) after using a geolocation tracking app for a two week period. In this discussion, I show how geolocational awareness is associated with attitudes, values, and opinions about urban life, sustainability and mobile locative devices. Chapter Six is a concluding analysis of my research findings, interpreted through the theoretical approach developed in Chapters One and Two. Here I argue that the potential for perceptual shifting enabled by geolocational media empowers individuals - albeit

somewhat unevenly - in very particular ways. This perceptual shift and sense of empowerment, I argue, can lead to improved forms of community interaction and deliberation, which hinges on an express articulation and acknowledgment of locational media literacy in everyday experience. I also examine how the micropolitical struggles of users with geolocational media signify the potential for broader political change as these technologies become progressively more accurate and granular, more surveillant and invasive, and more overdetermined in terms of their capacity to connect individuals in networks together in constant fashion. Chapter Six also concludes the dissertation, synthesizing my research's main contributions to the field of mobile media research and theories of technology, and making suggestions for future research directions in this field.

Chapter 1. From Mobile Communication to Locative Media Studies

1.1. Background: Mobile Communication in Canada

New modalities of mobile communication have become ubiquitous in a short span of time. Since the commercialization of the early analog cellular phone in the 1980s, everyday life in modern societies has been subtly but continuously transformed by the growing adoption of wireless mobile devices, the diversification of uses to which wireless mobile devices can be put, and the policy and market forces that have made an impact on how mobile devices are designed, marketed, sold, used, and discarded. According to the Canadian Wireless Telecommunications Association (CWTA), there are over 30 million mobile phone subscribers in Canada (2016), representing over 80% of the population. The wireless industry in Canada draws revenues of \$23.6 billion. This accounts for nearly half of all telecommunications industry revenue. While the growth in wireless mobile communication has dominated the Canadian telecommunications sphere for over a decade, wireless revenues are still slightly lower than overall revenues (\$24.2 billion) for wireline [including DSL internet service, long distance, and landline telephone service] (CRTC 2016).

The Canadian wireless industry is dominated by three major companies who account for over 90% of all wireless subscribers, with the remaining 10% accounted for by smaller regional providers, mobile virtual network operators (MVNOs) and resellers (CRTC 2016). This overall industry structure has been consistent since the origin of wireless phone service in Canada (CWTA). The three major companies - Bell, Rogers, and Telus - dominate different geographic regions of Canada, owing in part to the legacy

of the Stentor Alliance² and the economic limitations of building infrastructure in a country as large as Canada.

Canadians' three most popular activities on mobile phones are text messaging, internet access, and email (CRTC 2016). This has changed significantly since the debut of the iPhone in 2007, which was the first handset to offer third generation (3G) network service in Canada. The iPhone also shifted the paradigm for mobile phone use from the "Feature phone" paradigm (talk and text being the primary features) to the "smartphone" paradigm (in which roaming access to IP networks, a touch screen, a camera, and web-browsing apps became the focal and defining characteristics of the device).

Locative media plays a small part in the wireless market in the early years, confined largely to artistic experimentation and locative gaming apps (Gordon and de Souza e Silva 2011). Partly, the delay in implementation of location-aware apps had to do with the lack of public accessibility of mapping and data aggregation techniques. By 2009, apps like Foursquare and Gowalla offered smartphone users a platform for exploring urban space. Foursquare offered users the opportunity to become socially invested in locations they frequented, and awarded badges (such as "mayor of the Starbucks on Cambie and Broadway"). Akin to customer loyalty systems, Foursquare's model never achieved household status, peaking at approximately 45 million users in 2014 (de Souza e Silva and Sheller 2015).

Policies impacting the spread and uses of mobile and wireless communication in Canada follow a similar trajectory to that in other Western market economies in recent decades. Canada's wireless radio spectrum is regulated by the Federal government, licensed to operators who bid competitively on spectrum licenses. For the most part this competitive process has worked to sustain conventional patterns of corporate ownership and influence in the wireless sector. Given the legacy of Telecommunications policy in Canada, which held for decades that telephone operators must provide equal access at

² The Stentor Alliance (1992-1999) refers to an agreement between the major telecommunications companies in Canada to provide standardized local and long distance telephone services across Canada, with each company (publicly or privately owned) securing a regional monopoly in one part of Canada, while not expanding their services to other regions where another company held the monopoly. The maintenance of this alliance (between a mix of public and private regionally-based monopolies on telephone service) helped reinforce the traditional regional structure of Canada's telecommunications industry.

reasonable prices to all Canadians, wireless companies and wireless divisions of traditional telecommunication providers have struggled to assert that wireless mobile phone services constitute something other than a public utility. In recent years, with the increased accessibility of IP based networks via 3G, 4G, and LTE network technologies, the political discourse around telecommunications has become mixed with Internet policy discourse. The Internet was originally designed to be a fault-tolerant, equal-access-to-all-nodes platform, and despite its intense commercialization over the 1990s and 2000s (Castells 2000), it is widely seen as a network that should be accessible to all, as if it were a public utility. The culture of the wireless phone business is different, having roots in the political environment of the late 20th century, wherein Canadian telecommunications policy has increasingly emphasized deregulation and increased competition.

1.2. Locative Media Studies and Mobile Communication

In part, the present study examines mobile communication devices, so it is important to ground the work in that well-established field at the outset. Summarizing the entirety of mobile communications studies would be insurmountable and too lengthy for inclusion in this chapter. Partly for this reason, my review of the literature is selective. Also, because the present study is limited to locative media practices – and not all studies of mobile communication focus on this subject – it is important to extend the work of mobile communications into a review of work (both inside and outside of mobile communications studies) that focuses explicitly on locative practices.

To begin with, mobile communication research is a long established interdisciplinary field of inquiry. It emerged in response to the growing use of mobile phones in the 1990s, and has continued to evolve along with the most important technical and social changes that have transformed the way mobile phones are integrated in modern technocratic societies: smartphones (especially the iPhone), the deployment of 3G networks, the advent of the “App Store paradigm”, mobile social networking, and locative media.

There are arguably four major theoretical approaches relevant to all mobile communication research, well summarized by Green and Haddon (2009): circuit of culture, social shaping, domestication, and the “new mobilities” paradigm.

1.2.2. Circuit of Culture Approaches

The “circuit of culture” approach to mobile communication studies looks at how practices of consumption and production (i.e., of mobile phone technologies) influence each other. These approaches typically examine practices within industrial production settings and look for patterns in the ways that cultural practices among users of consumer technologies are influential upon the design and regulation of those technologies. In this sense the operant term is “culture” (using the anthropological definition of that term), wherein the processes and practices of production, distribution, regulation and consumption are all viewed as structured according to cultural patterns (Green and Haddon 2009, pp.3-7).

1.2.3. Social Shaping Theories

Social Shaping theories of technology and society include a wide range of theoretical and ethnographic work from the traditions of social construction of technology, or SCOT (Callon 1987, Bijker, Hughes & Pinch 1987), actor-network theory (ANT) (Latour 1993, Law 1987), and other studies of innovation that are attentive to the ways in which technical design choices are shaped by social forces through the actions of individuals who are embroiled in particular social and cultural contexts. Social shaping approaches are useful in demonstrating the indeterminacy of technologies, or at least the ways in which their full range of social uses may not be fully anticipated.

For the SCOT researchers, the focus is on the positioning and goals of different relevant user groups, who play an important role in influencing technological designs. Technologies are said to achieve “closure” over time, as relevant user groups eventually influence the designers of technologies to commit to changes that conform to their needs and wants.

For ANT theorists, there is more of a tendency to include the agency of the technologies themselves in constraining the options available to human individuals and groups who are also active in shaping the design of technologies.

In some ways ANT resembles what Ling (2004) and others call “affordances” theory – which posits that “the properties of objects determine the possibilities for action” (Sellen and Harper, 2002, p.17, cited in Ling 2004, p. 24). As Ling argues, however, the

“possibilities for action” are often sites of resistance by users, and users of new technologies often have to spend much effort and time learning new techniques, such as how to move a cursor with a mouse, or how to compose text messages via a number keypad (pp.24-25). As Ling also points out, “affordances” theory is something of a tautology (p.25).

Moreover, social shaping approaches, while instructive, do not give a complete picture of how mobile communication becomes incorporated in the everyday lives of mobile phone users.

1.2.4. Domestication Theories

The domestication approach to mobile communication examines the broader lived context of consumption of new technologies, in which attention is focused on the ways in which users of technologies incorporate new technologies in their everyday practices. This includes an examination of how technologies are incorporated in the maintenance of social relationships. (Green and Haddon 2009, pp. 7-8).

1.2.5. Mobilities Research

Mobilities research, as de Souza e Silva and Sheller describe it, comprises a range of inquiries into the “systematic movement of people, goods, and information that ‘travel’ around the world”, the infrastructures and institutions that sustain and pattern these movements, and the practices and affective experiences associated with “movement, stillness, pausing and waiting” (2015, p.2). This body of work examines, among other things, how travel and traffic (and immobility, too) are implicated in the constitution of individuals, places, cities, nation states, and other social formations. Perhaps most importantly, the mobilities framework, in its attention on the role of mobility in the formation of social networks, raises questions of “unequal access, rights and capabilities” (p.2). Elsewhere, Sheller (2017) clarifies that the “new mobilities paradigm” (Urry and Sheller 2006) is in contradistinction with more well-known uses of the word “mobility” in social sciences. She contrasts the new mobilities paradigm with more familiar approaches to the notion of mobility (such as Castells’s “space of flows”, or Deleuze and Guattari’s nomadism), by articulating “mobilities” as focused less on an examination of the present, and as more of a framework with broader historical scope:

the field is not saying simply that the world is more mobile now or that borders are not important; the reasons why we want to study mobility go beyond a thematic topic or a description of the present. It concerns more fundamental theoretical frameworks, which is why we call it a new paradigm. The idea of mobility is a historical one; it's deeply rooted, it forms global economic systems and social cultural systems. It's not just studying the present moment right now (Sheller 2017, p.52).

Sheller makes the case for the new mobilities paradigm by connecting it to familiar, historical subjects in the study of communication: emphasizing how communication has traditionally been deeply linked with mobility:

the very idea of communication used to depend on movement. If you wanted to connect and speak to someone else who wasn't in your immediate vicinity, you had to get up and physically move, or you had to inscribe your thoughts on a piece of paper, or maybe papyrus, or a rock, and move that. Communication and movement used to be united...then, as different technologies emerged, such as radio, telephone and internet, communication and the physical movement of a person or object became more and more delinked (p.53).³

In the original articulation of mobilities studies as a “paradigm”, Sheller and Urry (2006) persuasively make the case that the social sciences seem to be in the midst of a shift in thinking about mobilities. Drawing in a very broad swathe of inquiries across the social sciences (from geography, to anthropology, to science and technology studies, to studies of immigration and diaspora), the authors critique what they characterize as the “sedentarism” of prior social scientific studies, which they argue treat “as normal stability,

³ The resonance with Harold Innis's work on space and time biased media should not be lost on us here. While Sheller never mentions his work, Innis's theory of the relationship between media technologies and the spatial tendencies of human societies resonates well with Sheller's premise. According to Innis, *space-biased media* (lightweight, portable technologies like paper, papyrus, and electronic media) lend themselves well to societies that are militaristic, imperialistic, and that achieve a wide geographic distribution. Conversely, *time-biased media* (heavier, more sedentary technologies like stone carvings, and heavier bodies like the human ones that bear oral traditions) reinforce societal tendencies toward hierarchy and localization (Innis, 2008 [1951]).

meaning and place, and treats as abnormal distance, change and placelessness” (p.208). Sheller and Urry argue that sedentarism privileges certain mental formulations of place, identity, and social identity (including those constituted in national borders) as normative, which of course excludes the many forms of mobility that seem to characterize modern global capitalism: diaspora, migration, and globalized industrial production, to name just a few. Further, Shelly and Urry point out that where mobility is addressed in prior studies, it typically only examines a romanticized, privileged form of “nomadism”: one that is urban, male, and Eurocentric in its outlook (pp.210-211).

The “mobilities paradigm” has also been subject to criticism from both inside and outside the field of mobilities studies more generally. Feminist critics have pointed out that the mobilities paradigm has defined itself around Eurocentric, masculine concepts about mobility and fluidity, or has centered around the work of predominantly male geographers, which has resulted in the exclusion of accounts of women’s experiences with mobility (p.54). Sheller acknowledges that advancing and amplifying the work of women scholars within the emerging field is a legitimate concern (p.54).

The “mobilities paradigm” broadens our thinking about modern mobile locative media, in the sense that the particular kinds of mobilities afforded by locative media can be seen as existing within a continuum of social mobilities and immobilities, which inscribe and reinforce economic, gender, and racial inequalities among individuals and groups. While it may not be necessary in all research scenarios to fully contextualize mobile locative media within the broad range of movements of people, materials and information around the globe that the new mobilities paradigm invokes, the revised idea about mobilities Sheller articulates strongly resonates with the history of communication technologies and communication scholarship in a fundamental way, especially as it relates to the historical relationship between communicating and moving about. While there is certainly room to critique, refine, and improve Sheller’s paradigm, there is also great potential in articulating its continuity with communication theory.⁴

4 Again, the aforementioned work of Harold Innis is relevant here. So is the work of James Carey. Carey (1988) argues that modern thinking about communication relies on a transportation metaphor, in part due to the fact that industrial communications technologies like the telegraph and telephone were seen as essentially similar to the movement of people and goods over long distances, and that electronic communications networks were initially built along existing transportation infrastructure like railroads

1.2.6. Locative Media Studies

To this four part framework I add on to this a distinctive “locative media” studies, mainly in the work of de Sousa e Silva, Frith, Gordon, and Farman. This includes work on locative media and locational technologies that have emerged over the past half decade.

Adriana de Souza e Silva and Mimi Sheller (2015) situate studies of locative media at the nexus of three interdisciplinary research areas – the “new mobilities paradigm”, mobile communication research (both summarized above), and locative media art (pp.2-3). Given that locative media studies needn’t always follow the “new mobilities” paradigm, and given that its genesis is in an entirely distinct interdisciplinary field, I believe that locative media studies deserves to be enumerated as a fifth category of mobile communication studies.

Locative media studies is a much more recent development that lives both within and outside the new mobilities paradigm. Here I provide an overview of the contribution of locative media studies to our current knowledge. I look with special interest at the work of Jason Farman, whose phenomenological approach to locative media is used as a discursive launching pad into the present inquiry.

Three books are seminal in establishing the parameters of locative media studies: Gordon and de Souza e Silva’s *Net Locality* (2011), de Souza e Silva and Frith’s *Mobile Interfaces in Public Spaces* (2015), and Farman’s *Mobile Interface Theory* (2012). The first of these titles describes the history of the conceptualization of the internet as located and locatable. The second title provides a rich overview of locative media research across a range of contexts. The third title, to which I give the most attention in this chapter, sketches out a phenomenological approach to locative media research upon which my research builds.

Gordon and de Souza e Silva’s *Net Locality* (2011) marks perhaps the first systematic assessment of the locatability of the internet. The authors describe the

(p.15). This kind of thinking - what Carey calls a “transmission model” of communication - is reflective of a broadly instrumentalist or “solutionist” kind of thinking about communication media, and about technological innovation more generally. In Chapter Two, I examine how critical constructivist theory offers us a viable critique of this instrumentalist kind of everyday thinking about media and technology.

paradigm shift in our thinking about the contrast between physical and virtual as a result of the ubiquity of networked technologies. They also describe how the “database is all around us” now (p.7). Gordon and de Souza e Silva predict a world in which dataveillance is normative, and in which “locating ones self... literally sets the conditions for interaction and provides the context from which information is interpreted and used.” They go on to write that “location, therefore, is of greater significance then other forms of networked identity” (p.12).

The book traces a historical arc of social mapping practices (such as cholera maps in London, GIS systems, and Google Maps’ transformation of search) in order to situate contemporary (c.2010) locative media apps within a broader context of using locatability and mapping to achieve collective goals (p.13). They review the history of art and research projects where the ideas of mobile annotation and location based social networks were first explored. They then discuss the setting of the modern city as a “hybridized space” of digital and physical networks. Citing numerous case studies, the authors argue that

the experience of net locality translates what we understand as near, and how we understand the co-presence of other individuals. Noting someone’s presence in a location-based mobile game, or tracking somebody’s located updates on a LBSN⁵ alters one’s perceptions of the composition and boundaries of the environment... (which has implications for) our traditional understanding of what makes “good public spaces.” (p. 14).

Further, Gordon and de Souza e Silva argue that our conception of both civic participation and privacy have been altered by the affordances and constraints of net locality, and conclude with some uncertainty – posing the question of “whether or not (location) awareness will compromise or enhance our personal freedoms and capacity to act in a complex and networked world.” (p.15).

Moreover, their book is a pioneering effort to envision the implications of a locationally-aware “hybrid” world, and the authors do an adequate job in setting up some of the most important thematic questions for location media research.

5 Location-Based Social Network platforms like Foursquare or Gowalla.

De Sousa e Silva and Frith's *Mobile Interfaces in Public Spaces* (2012) is a comprehensive review of prior research into locative media and its implications across a range of contexts. These contexts range from “non-dialogic” (one way communicating) devices (iPods, the Walkman, and the book, which the authors contend are similar to location based mobile apps in that they give users the opportunity to negotiate their relationship with their immediate physical environment) to “dialogic” media (such as early location based games like Botfighters and Mogi, which began to immerse user groups in experimental situations where their ideas about virtual and physical space and mobility were renegotiated), to more recent services like Gowalla and Foursquare, which involve users in ways that show how location information has become a commodity.

The authors explore a very wide range of issues in this book – from unpacking theories of surveillance and power (via Foucault and Deleuze), rethinking models of privacy (via Solove [2004] and boyd & Hargittai [2010]), to commodification and differential access (Andrejevic [2009] and others), to an account of locational privacy and its relation to power.

The authors situate the central dilemma about how mobile interfaces change the way we interact with our surroundings and other people as one of *control* rather than *disruptions* to our values regarding privacy. We tend to notice how privacy is renegotiated in public spaces with new interfaces like the book, the Walkman, the iPod, the mobile phone, and locative media, but really what is at stake is a struggle for *control* over the terms of how our privacy is managed. We do not actually have a normative idea of public/private that is easily explained in the first place. As de Souza e Silva and Frith point out, we have a problematic view of the private/public dichotomy, which reflects highly divergent definitions of privacy and publicity. Following Weintraub (1997), the authors delineate four distinctive models of privacy that inhabit common articulations of the concept: first, a “citizenship” centered model (derived from theories about the public sphere, and especially the work of Hannah Arendt), second, a feminist model (in which the notion of private is coded as and located in the domestic, subjugated sphere, while “public” is coded as male, outdoor, urban and dominant); third, an economic model (where the terms of reference center around the distinction between “public sector” and “private sector” institutions and actions); and fourth, a “sociability” model, distinguishing the private sphere from the public as conceived as a “co-existence of heterogeneous individuals”, and in which the world of private interests and concerns comes into conflict

(reflected in the “New Urbanist” works of – and inspired by - Richard Sennet and Jane Jacobs) [pp.52-54].

So the public/private dichotomy is a false one – it changes with respect to the approach taken, and shifts over time (p.54). Accordingly, these different definitions crop up in common conceptions and accounts of various technologies like the book, the Walkman, the iPod, the mobile phone, early location based games, and contemporary (c. 2011) mobile social media like Foursquare and Gowalla.

De Souza e Silva and Frith take some of their cues from the early work in the field of ubiquitous computing (Dourish 2001). They reason that insights about human-computer interactions in surveillant environments do not center notions of privacy in their formulation. Instead, as Paul Dourish learned in his research into developing interactive environments with embedded computing devices, ubiquitous computing research gravitated toward questions about control, automation, and the implications for human agency in such networks (pp.140-142). Privacy as a social norm, for de Souza e Silva and Frith, is a sociocultural construct that is largely shaped independently of the technological environments in which it seems to become more or less prominent.

In their chapter on locational privacy, the authors examine how mobile privacy has additional dimensions compared to privacy in the context of the internet. Worries about surveillance are articulated as worries about “top down” surveillance as well as *collateral* surveillance (i.e., wherein one’s location is shared with friends and trusted contacts within digital social networks). Surveys show that people tend to accept some degree of governmental and even corporate surveillance as acceptable, despite the fears some have of “Big Brother”-type dystopian scenarios (p.121). Most governmental surveillance is conceived of by the public in terms of ostensible protection from criminality and terrorism, while corporate or marketing-related surveillance meets wide acceptance due to the common belief that the individual tradeoffs in such transactions are worthwhile (i.e., exchanging private information in order to use services or gain consumer incentives) [p.124]. In addition, most people surveyed tend to accept some forms of collateral surveillance as generally benign (p.125). These same surveys demonstrate that what individuals are most concerned with is not so much privacy but *control* over who has their location information, and *for what purpose* the access to location information is granted (p.128). This, de Souza e Silva and Frith argue,

underscores important differences in the way the individuals surveyed think about privacy in the context of mobile networks (as compared to thinking about privacy in internet-based networks more generally).

The authors then go on to consider the widely-known theories about electronic privacy espoused by Solove (2008) regarding the problematic nature of how privacy is framed today: transparency, exclusion, and aggregation. Privacy issues arise around *transparency*, they argue, when individuals' right to control who can access their information is taken away (boyd & Hargittai [2010], Solove [2004], Weiser *et al* [1999], cited in de Souza e Silva & Frith [2012, p. 128]). For Solove (2007), *exclusion* happens when people are prevented from having knowledge about how their information is shared, or denied the opportunity to make corrections to that information (p.128). Finally, *aggregation* creates problems with how privacy is respected because of the way that data takes on new meaning when it is aggregated along with additional data. While an individual's location information is not very meaningful on its own, when it is combined with other information about that individual (consumer transaction data, or health data, for examples), it might take on important new meanings that that individual may not have wished to reveal. They may also be unaware that said aggregation is piecing their data together in this way (129). Problems arise with privacy when aggregation creates narratives about us that we didn't want to have told, the authors argue. The issues of agency and control are more important framing concepts in mobile digital networks than merely the notion of "privacy".

Another very important part of de Souza e Silva and Frith's work is their account of how notions of "private" and "public" are nebulous and overlapping, and they point to a few key examples that illustrate how this works. In the private sphere (under the feminist or "citizenship" models) there are spaces which are "public within private": living rooms where guests are received and entertained, in contrast to more private spaces within private dwellings (p. 55). There are also instances of the "private within public" (such as Walkman or iPod use with headphones, or reading books) that de Souza e Silva and Frith explore at length (pp.59-74). In accounting for these public-within-private spaces, they recapitulate Raymond Williams's notion of "mobile privatization" (1973), focusing primarily on his characterization of television as bringing public life into radically private, individuated dwellings. This is a persuasive account, but there are other possible – and divergent – ways to illustrate the concept of public-within-private spaces that are closer

to the topic at hand (mobility in public space, that is). For instance, the authors do not interrogate the form of “mobile privatization” fostered by the “private” space of the automobile as a vehicle to transit through public space (which invokes the inverse notion of private-within-public)⁶.

The authors then go on to examine how power relationships and asymmetries are reinforced or resisted through location aware technologies. Child-monitoring techniques as well as parolee location monitoring provide insights into how power relations play out with respect to locational privacy concerns. While child monitoring via Global Positioning System (GPS) information can reinforce the power asymmetry between parent and child, children find ways to evade detection using these technologies too (leaving the GPS device at a friend’s house where they are supposed to be sleeping over innocently, while instead they go out without the phone to a party, for instance [p.145]). In the case of parolees (where there is little room for “resistance” on the part of parolees without real consequences), location aware technologies reinforce a certain kind of control and asymmetry, which disciplines the parolee and parole officer alike (pp.142-3). For the parole officers, false positive “out of bounds” warnings mean that data are less accurate, which leads many officers to feel like they have less control over their parolees (p.143) [among other issues, not least of which is being responsible for a larger number of parolees, since monitoring is implemented to make parole officers work more efficiently, from an institutional perspective]. Again, the findings cited by de Souza e Silva and Frith point to an emphasis on struggles over agency and control rather than “privacy”, more loosely considered.

De Souza e Silva and Frith frame their discussion of power here in Foucauldian terms: that power is woven into society, and that it does not solely inhere in particular social actors or institutional organs. Power is instead seen as a logic that animates a network of relationships between interactants (p.138). They also invoke Deleuze’s idea that networks of power have become invisible to us, and how mechanisms of control have left institutions of power and infiltrated everyday life in a continuous fashion (pp.138-9; Deleuze 1992, p.7)

6 Elsewhere, others (see Ling 2012) do explore this phenomenon as a historical phenomenon, but not as a means to explain hybrid spaces *per se*.

Further illuminating on the complexities of power in urban spaces, the authors describe the phenomenon of favelas (slums) in Rio de Janeiro, which they describe as entangled within cities, illuminating how social class is articulated as entangled uses of urban space. The favelas are in such close proximity to Rio's middle class neighborhoods – indeed, they are interwoven and overlapping in some places – so that slum residents are in some cases able to steal from the middle class residences by means of a fishing line (p.156). Nonetheless, the paths through the city traced by slum residents are almost entirely different than the paths trod by their wealthier neighbors: “these people live below the poverty line and suffer from a lack of education and a lack of basic services, such as proper water pipes and electricity. Although they walk through the same streets where the elites shop in expensive boutiques, they have a radically different experience of that urban space” (p.156). The description is not unlike that of two galaxies in collision.

The authors reiterate an idea that comes up time and again in locative media studies (and an idea that I take up in the present work as well): how location is a key marker of the presentation of the self. This, the authors point out, is invoked by Gordon and de Souza e Silva's notion of “net locality” – the shift toward understanding the internet as having place, and of being in places, in which “location becomes the organizing logic of our networked interactions” (p.169). By association and identification with places, individual identities are defined and articulated.

But the analysis of how individuals associate with place is more complicated than that. As de Souza e Silva and Frith argue, locations are read *hypertextually*. As individuals share their location information, meanings are created in relation to other locations they visit, and the multiple locations we visit while mobile acquire meaning from each other, much in the way different elements of a story or narrative develop meaning in their interconnections (pp.176-7). We do this using what de Souza e Silva and Frith call “hybrid spaces” (p.179) (spaces that include physical locations as well as digital information), and reading cities hypertextually redefines our experience of these hybrid spaces. Instead of reading a text as its author intended, readers become authors through hypertext, because the reader decides which links to follow (p. 177).

De Souza e Silva and Frith chart the terrain of locative media studies by looking at how power and control inhere in new configurations of people, places, and interfaces.

The strength of de Souza e Silva and Frith's work is in their synthesis of theorization about locational privacy. Their account of how power relationships are enacted at the level of interface and infrastructure are somewhat unfinished. While their Foucauldian account of power is intriguing and effective, their analysis is confined to a few informative case studies (in location based services and probation tracking) that unfortunately lack ethnographic granularity and breadth. This is not a fault of the authors – it is simply a call for more detailed ethnographic work in this area. As I discuss below, Jason Farman's writing (2012) works to further develop their account of power and location, using a phenomenological approach.

1.3. Theorizing the “sensory-inscribed” interface

The most widely known application of phenomenological theory to locative media is Jason Farman's *Mobile Interface Theory* (2012). Here, I examine this approach. I will show that while Farman's phenomenological approach is highly insightful, it is nonetheless constrained as a political or moral project through its limited analysis of politics and power.

Farman tries to wed phenomenology (Merleau-Ponty) and poststructuralism (Derrida); to explain how modern mobile embodiment is “sensory inscribed”. For Farman, *embodiment* is something we actively practice, and media technologies that try to enhance embodiment only *pretend* to give us an experience of embodiment. For Farman, the assumption that sensory enrichment will make our mobile connections more intimate is faulty, because it assumes that bodies and spaces exist *a priori* of embodiment⁷. In other words, mobile technologies may reduce embodiment, following McLuhan's cool media theory to the conclusion that technologies that require our

⁷ This, Farman says, is closely aligned with Lefebvre's assertion that the production of space also produces embodiment (p.21). I will elaborate on this point in Chapter Two.

participation have a numbing or disembodied effect [Farman 2012, pp. 19-21]⁸. This is the heart of Farman's critique.

For Farman, virtual⁹ experiences inform and are mutually constitutive with "the real". Farman contends that while virtual experiences are almost always premised on material interactions, our "embodied practice of space on mobile networks strongly reinforces our sense of embodiment in the material sphere" (pp.22-3). In other words, we experience the "virtual" as embodied (partly, through interfaces), which helps to amplify our sense of material embodiment where we use mobile networked devices in materially embodied spaces.

Farman takes the position that culture is pre-personal, and hence it is culture that shapes embodied interaction [he writes that Dourish's notion of "embodied interaction" is incomplete because it fails to accommodate this] (pp. 23-4). He picks up Derrida's idea of the *mise-en-abyme* (meaning, roughly, the heraldry of culture) to show that while we cannot escape being cultural, we can describe culture within culture – we do not need to get outside of it to describe it (p. 24). So embodiment, for Farman, is largely the product of a "pre-personal" cultural framework, to which the embodied individual must adapt. Farman subscribes to N. Katherine Hayles's notion of embodiment in this regard. He agrees with Hayles that neither media nor embodiment alone are sufficient to determine our being, which is instead "encapsulated within the horizon codetermined by media conditions and cultural formations (Hayles 1998, p.102, in Farman, p. 25). For Farman, then, the conditions of our material-virtual embodiment are largely determined before we take up space in any way.

8 According to Marshall McLuhan (1964), "hot" media (which provide all of their information to our sense simultaneously, like print media or cinema, do not require our active participation, while "cool" media like radio or television require our sense organs to work to reassemble the representations we take in). For McLuhan (and Farman seems to follow this here), when media amplify a particular sensory organ like the eyes, there is an effect not unlike "amputation", by which our experience of that sensory function becomes more like our interaction with another body – our senses are incorporated into a neural network, which is a disembodied experience.

9 In its common use, "virtual" is falsely opposed to "actual", because "virtual", in its originary form, refers to potentials, the not-yet-realized, or virtues. The more modern notion of "virtual" as "not real" is a misleading definition, according to Farman.

Mark Hansen's "bio-philosophical" theory of embodiment takes a helpfully related approach to the question of the relation between virtual and material, and Farman introduces this alternative view. Hansen's theory draws on Merleau-Ponty's phenomenology - that all of our knowledge is premised on the sensory information mediated by our bodies, and that all embodiment is sensory-derived. Farman argues where this leads, in Hansen's formulation - to the conclusion that our experience of our bodies is reliant on the sensory interaction between the limits of the body, the space that contextualizes it, and the interactions between them (p.26). Farman then explains how this theory accounts for much about mobile, locative media. To wit, location based social networks "offer a form of intersubjective embodiment that gives participants a sense of social proprioception: a sense of embodied integrity that is aware of the self's place as that which is always already situated in relationship to the location of others" (p. 27). While the account provided by Hansen may not be entirely consistent with the idea that culture is pre-personal (which Farman believes), it is certainly consistent with the notion that cultural formations and media affordances present a horizon at which our being is taken up.

Farman then explains that there is a "cognitive unconscious" upon which embodiment depends. In this sense, individuals are conceived as having to block out parts of the world in order to get on with their everyday lives. Without this blocking out of irrelevant features of their environment, their relationships with other individuals would be impossible, and their sense of self would become dislocated from place (p. 27). Our embodiment, for Farman, is practiced unconsciously as well as consciously. The various sensory inputs of our bodies recede from conscious awareness so that we perceive ourselves as a unitary body. Thus our experience of embodiment can be said to have unconscious as well as conscious elements. Farman likens this to Heidegger's idea of "ready-to-hand" equipment. Equipment that is "ready-to-hand" disappears so as to become invisible, or an extension of the hand¹⁰. In contrast, "present-at-hand" refers to the thing when it is the object of our conscious attention (like when we pull the phone away from our ear to examine the screen to see if we still have reception) (pp. 28-9).

10 It is possible to conceive of proprioception in less simplistic terms, of course, and in ways that include our bodies more specifically. "Phantom limb syndrome" or McLuhan's "extensions of man" come to mind. In the latter case of McLuhan, our consciousness of our bodies implicates not only the objects or media technologies that amplify our senses, but also the muted sensibilities that occur as a result of our sensorial add-ons (media).

This oscillation of things and sensory inputs between our conscious and unconscious awareness has an ethics, what Farman terms an “ethics of immersion” (p. 29) and a politics. He uses the political theories of Althusser and Gramsci to elaborate this point. He writes that “embodiment is always conceived in relationship to modes of inscription” (p. 30). In other words, following Derrida, all we have is a constant reading of the world, and symbolic systems. Meaning is always deferred in the act of reading, and the process is ongoing: “our embodied engagements with each other are always about meaning being deferred as we interpret words, gestures, clothing race, gender, sexuality, and the cultural signifiers that are inscribed onto the body” (p. 30). Finally, our process of reading always resists arriving at complete meaning, just as our practice of embodiment always must resist full, embodied presence (p. 30).

Farman then returns to the subject of Hansen’s “bio-philosophy” and ends with a re-articulation of his central concept of proprioception (the experience of the sum total of the body’s tactility, in which the body is no longer defined as a subject or object, but as simply a body experiencing [p. 31]). Perhaps problematically, both Hansen and Farman primarily apply proprioception in terms of things external to the body. This limits the discussion to questions like “where is that mode of transportation in relationship to your current location?” (p.31). In this arguably limited notion of proprioception, Farman argues, we are empowered to “locate ourselves in relational space at all times” (p.31).

For Farman, proprioception is perhaps the most important sensibility in influencing our being in urban space. He writes that

this sense of being “here” in the world extends well beyond the limits of the skin toward a relational being-in-the-world. In doing so, the spaces we inhabit fluctuate from our immediate surroundings to the distance between us and a destination or between us and another person (p.32).

But, he argues, proprioception is not everything:

our bodies, as culturally inscribed, are constantly read. Simultaneously, we are inscribing our bodies and the bodies of those around us. We “signify” identities through the cultural inscriptions of masculinity or femininity, the signifiers of our cultures, our sexualities, our religions, among other

aspects of our embodied identity that we read in others and encode on our bodies for others to read (p.32).

This is often expressed as an interpellation (following Althusser, wherein our identity is inscribed by an interpellator, who “hails” us, as in the Frantz Fanon example Farman considers [of the “dangerous black man”] (pp.32-33). This ongoing process of reading and inscribing animates what Farman calls a “hermeneutic reading of bodies in cultural space” (p.33).

This analysis culminates in a wedding of phenomenology and poststructuralism, which is Farman’s central project of building an embodied - and potentially political - theory of interfaces. We are simultaneously embodied via our perception of being in the world (through proprioception, the experience of things ready-to- or present-at-hand, and through a cognitive unconscious), and through our reading and being inscribed bodies in the world. This “sensory-inscribed body” is both a sensing thing and a sign system (p.33).

Farman then contends with the dissolving of physical and “virtual” spaces, in order to account for the modern experience of information-laden urban landscapes. To account for this phenomenon systematically, he argues, we need to move on from commonsense notions of “virtuality”. He refers to the prior work of Elizabeth Grosz here, who contends that our experience of virtual spaces is dissolving into our everyday lives, and that this is most profoundly happening on the level of perception (p. 36). Our notion of what is real and embodied is becoming more complicated because of our everyday engagement with the virtual.

However, Farman maintains, the virtual/real dichotomy is false (p. 36). He explains this in reference to two prevailing theories of the virtual. In the first formulation, “virtual” as we currently understand it stems from 17th century Christian uses of the term, in which “virtual” refers to the *nonmaterial aspects of worship* [an inner connection to God, in contrast with prayers, which are material] (p. 37). In this sense “virtual” (rooted in “virtues” or being “virtuous”) is a metaphysical matter, and for many religious people, the metaphysical is more “real” than the material world (p. 37)¹¹.

11 This sounds a bit like “pure forms” in Platonic thinking, but Farman doesn't go there, and I don't have the space to do so either. Maybe another time.

The second formulation of “virtuality” is as simulation. De Souza e Silva and Sutko (2011) argue for the emergence of the idea of the “technological virtual” - that the environments we meet in in cyberspace are seen as “simulations” in contrast to the very real physical devices through which we access them (and the physical rooms and habitats within which we do so). This is linked to a historical shift in computing from “a culture of calculations to a culture of simulations” (Farman 2012, p. 37). De Souza e Silva and Sutko make the connection between modern fears over violence and video games to Plato's fears about art as a representational form (the cave allegory). Farman also invokes Umberto Eco to reinforce this view: that once there is a one to one relationship between a thing (space) and its representation (map), the map destroys the thing; they are unable to co-exist (p. 37).

Both of these definitions of the virtual fail us, argues Farman. Virtuality is experienced as a multiplicity (not a replacement for nor erasure of reality), and virtuality has a physical embodiment, too. These theories don't account for this (pp. 37-8). We always experience the indelibly linked virtual-actual in our everyday lives. We are perhaps noticing it more during the era of smartphones (in particular) and pervasive computing (in general) because these technological assemblages have “allowed for online space to interact with material space in unprecedented ways” (p.39).

But, Farman writes, while both Deleuze and Hayles both characterize the virtual as a “process of becoming” (p.39), the experience of mobile computing virtuality extends the virtual into “being-as-becoming”, which Farman defines as “ a present-tense experience of embodied space informed by past and future potentials...informed by various modes of representation” (p. 39).

One feature of this new experience of virtual-actual, Farman contends, is in site specific data (p. 39). Farman describes augmented reality (AR) in this respect, which augments the meanings of spaces by accessing data, visualizing it and then layering it on top of physical space via a device or interface. He discusses a historical project called Streetmuseum to illustrate this concept (p.40). Site specificity engages us with information differently, and transforms the meaning and experience of texts [standing in University Church at Oxford reading about Cranmer's last sermon – which was written in that location - on a mobile phone] (pp.42-3). Experiences blending virtual-actual phenomena like this, Farman contends, characterize contemporary experiences with

information laden physical environments, and this signals changes in the ways we conceive of both our environments and our selves. Landscapes come to be seen as interfaces (p.43).

Farman then asks: what is different about holding up a historical photograph in a location rather than the same photograph on an iPhone in that location? The difference is in the agency of the user, and in the kind of embodied relationship with the interface we have (p.44). He writes: “our experience of place through mobile technologies is at once a phenomenological engagement with this particular medium and a mode of reading the significance of that mode of engagement” (p.45).

Maps are, of course, one of the longest lived modes of engagement with places. Mobile maps *implace*¹² us differently depending on the cultural contextualization that different kinds of mobile maps can provide. (p.45). The “disembodied voyeur” of the overhead Google Map view and the “situated subject” of Streetview offer a glimpse of this ideological difference (pp. 45-6).

Essentially, the way mobile media engage us with these different views emphasizes the fluidity we experience between both positions (Streetview and overhead view); we experience these perceptions together. They are mutually constructed:

We have thus moved beyond the theorization of our mobile devices as a type of prosthetic to our bodies – an extension of ourselves out into the material world – but instead have to conceive of our devices as absolutely integral to the very foundations of embodied space in the digital age. As Jean Baudrillard noted, “the territory no longer precedes the map, nor does it survive it” (p. 46).

Even so, Farman argues, we engage with maps so casually that we only ever interrogate them when they fail (p. 46).

One source of failure in mapping projects, Farman contends, is in where they are created from a strictly “top down” perspective. Satellite maps (such as those upon which Google Maps relies) are an example of one of these “false imaginaries” of the spaces we inhabit. These also represent a privileged form of representation since they excise

12 By this term, Farman means the opposite of *displace*.

humans and are disembodied, and automated (pp.48-9). It is precisely because human participation has been excised, Farman posits, that we tend to believe that these computerized representations are accurate representations of space (p. 49). In contrast, Farman describes how experimental projects like Nold's "Biomapping" can demonstrate how physical spaces can be "constructed by human movement, not by disembodied technologies" (p.49). In projects that take this "bottom up" approach to inscribing meaning into maps, "the map and the body are unified in a sensory-inscribed experience of the urban space" (p.49).

To walk the streets of a city provides one mode of emplacement, writes Farman. To use a GPS-equipped mobile phone while doing so "provides further levels of emplacement and signification" (p.49) in that users can situate themselves on a map, and become aware that they are being surveilled by others. In contrast, most mapmaking has always been an imperial project (p.50). Maps conventionally signify space in a particular way that fits with and reproduces cultural hegemony (p.52).

Mapmaking also has collective and individual-oriented applications. While individuals are privileged in map design typically, there are vastly different ways to conceive of mobile mapping apps as designed for collectives. The paramount example Farman cites is the use of the Ushahidi and Open Street Map applications in the aftermath of the 2010 Haitian earthquake (pp. 52-3). This project involved over 200,000 cartographers who worked to crowdsource information about structural damage, injuries and death, in order to aid with reconstruction, medical and relief efforts.

While Farman manages to articulate a few examples of how the "sensory inscribed" experience of locative media can be repurposed for collective ends, critically, he does not develop this into a tangible, more generalized political project. Gramsci and Althusser only get mentioned once, and twice (respectively) throughout this book.

Locative social networks recast social relationships (and relationships with objects in the built environment) geospatially, to be sure. In Farman's formulation of the "sensory inscribed", the phenomenological construction of the transcendent "other" is appropriately problematized with respect to mobile media interfaces, but the analysis seems unfinished. Farman has introduced the problem, but not completely interrogated it. If we are truly mutually co-constitutive with other ethical subjects, objects, and webs of

interfaces and relations between those things, how do we know ethical others apart from the refractions in these interfaces-cum-interior-exterior-mobius-strip mirrors? And if we do not perceive anything but refractions of phenomena in our sensory interfaces, we still have the task of interrogating how the structures built into technologies (often reflecting cultural, ideological, and institutionally-defined scripts) shape our experience of perceptions of and interactions with other sentient beings. Because of this, Farman's framework is particularly useful is its conception of the sensory-inscribed subject, but it has limitations on its own as a political theory. While it is useful to engage the ideas of Louis Althusser and Antonio Gramsci in rethinking the role of sensory inscribed subjects within broader political struggles, there is more work to be done unpacking the internal workings of technologies as they intermediate our relationships, and help us to sense and inscribe upon the world. Their designs matter.

The political and ethical weight of making sense of locative media, and how it reconfigures our relationship with space is an important project. From this review of prior inquiries, the three central themes - Gordon and de Souza e Silva's "*net locality*" (understanding the internet as having place, and of being in places, in which "location becomes the organizing logic of our networked interactions"), de Souza e Silva and Frith's theory of struggles for *control* (rather than disruption in values) in shifting location awarenesses, and Farman's "sensory inscribed" interface model - are clearly helpful in building a broad-ranging framework for understanding locative media. There is, however, more work to be done in terms of describing how this experience plays out differently for individuals in different predicaments of power and influence. Laura Maw's "Rhythms of Fear" blog post (2016), accounting for women's experiences of urban environs, makes clear why this is so. While in some respects, this essay risks oversimplifying the nuance in de Certeau and Lefebvre (more on this in the next Chapter), it nonetheless makes clear the point that the "read-write city" (just like the "read-write web") is more "read" than "write" for some, and the consequences of resisting pre-personal or cultural configurations that present themselves to us can invite trouble, even violence. While the interface (between body and city, or between screen and cloud) matters (and reconfigures us), what's consistent between both realms (city and web, individual and interface) is relations of domination and oppression.

In the next chapter I attempt to build upon Farman's notion of the "sensory inscribed". In particular, I contend that we may require a theory of locational literacy that

is premised on a conscious recognition of the proprioceptionary and socially symbolic matrix in which individuals find themselves. This is in some ways inspired by the work of Michel de Certeau, but also a departure from some of his presumptions about how knowledge and literacy are constructed. In a later Chapter, my field research reveals that individuals tend to become more self-censoring over time as their tools are made more “present-at-hand” and the interpellation and approbation of others becomes more readily accessible. We become better citizens when we are aware of ourselves as a citizen among other citizens who see us and interpellate us. My participant observation reveals some of the motivational concerns that drive this kind of awareness and conduct, revealing a set of individuals who are differentially self-aware in this regard, how their conduct is differentially shaped by this difference in self-awareness, and how they become motivated to change their conduct in relation to the inscriptions on and around them.

I also recast Farman's work in terms of Andrew Feenberg's critical constructivism, which (rooted in a critique of phenomenological theories of technology) offers a more nuanced political theory and roadmap to critical action in the space of mobile media. Henri Lefebvre's work on the production of space also plays an important bridging role here.. I do this to expand the theoretical base that underlies Farman's work, but also to bridge it with contemporary approaches to philosophy of technology, namely the critical constructivism of Andrew Feenberg. In doing so, I hope to offer a more complete political contextualization of phenomenological theory applied to locative media than has previously been articulated.

Chapter 2. Locational Literacy and Critical Constructivism

2.1. Theorizing Locative Media Literacy

As outlined in the previous Chapter, it has been much discussed in the literature on locative media that urban smartphone users are afforded the capability to see themselves from two perspectives: (1) the vernacular, localized, 'on the ground' perspective of everyday life in a city (whether mediated via augmented reality [AR], or via location based apps like Wikitude or Layar that enable users to augment locations, objects, and persons with metadata); and (2) the "managerial" or "planning" perspective offered through technologies like Google Maps, Runkeeper and other map-oriented applications. Smartphone apps like AR, map-based trackers, Google Maps and Google Streetview, in principle, permit users to experience both of these two perspectives, potentially (though not exclusively) simultaneously, like a constantly oscillating figure-ground perceptual phenomenon.

Users of the types of tracking software described above have become adept at using these tools. In what ways do they use them? How are their perceptions of themselves, other people, and the locations in which they live, work, commute and play impacted by the multiple perspectives offered by geolocation tracking applications and devices? In what contexts are users becoming subjects of - and objects of - geolocational surveillance, by governments, corporations, and other individuals? How do early adopters of such technologies renegotiate the terms of privacy and publicity in their everyday use of these applications and interfaces? Is it possible to identify a form of locational media "literacy" with respect to these uses of locative media? If so, what are the characteristics of "locational media literacy" in the context of digital media literacies more widely considered?

To outline the character and contours of "locative media literacy", it is necessary to first review prior work in "media literacies" in a more general sense. For reasons of scope, I limit the review here to theories and research into digital media literacies (or, as they are sometimes called, "new media literacies") to lay the groundwork for locational media literacy. I also review "locational literacy" as it has appeared previously in the

social scientific literature to arrive at a clear and informed definition of “locational media literacy” that takes locative media affordances as its starting point. In particular, I situate “locational literacy” within the terms of reference of “urban literacy” that is implicit in the work of Michel de Certeau (1984).

Following this, I then enframe “locational literacy” as a political project, using the theories of Henri Lefebvre and Andrew Feenberg. In doing so it is hoped that the political and ethical dimensions of location awareness, location privacy, and agency can be clarified in more granular detail.

2.1.2. Digital Media Literacies

Digital media literacies are usually framed as a set of skills or capacities that individuals and groups develop in order to adapt to the new demands and opportunities offered by new forms of interactive, participatory and networked media. Howard Rheingold and Anthony Weeks (2012) elaborate a set of five “digital media literacies” that they argue are essential skills for navigating information online. Called “Crap Detection”, this model problematizes digital media literacies as a form of truth-seeking. The model is structured in a pyramidal structure, with basic new media literacies such as “managing attention” at the bottom, providing the foundation for more sophisticated digital literacies like “participation” (low effort and low commitment contributions to collaborative projects), “collaboration” (the capacity to author or contribute significantly to collaborative political projects), “network intelligence/Net Smarts”, and “critical consumption” (Rheingold 2010, Rheingold & Weeks 2012). The model acknowledges that the terrain of digital networking amplifies opportunities for participation and collaboration, but also presents challenges involving attention management and misinformation. The authors provide numerous examples of how to improve our skills in operating in digital networks so that more mutual understanding is achieved, building toward utopian goals like “digital democracy” and “collective intelligence” (2012:11-12).

Yochai Benkler (2006a) makes a similar case for the democratizing potential of digital media literacies, which are essentially skills for interaction and collaboration. While Benkler doesn’t use the term “literacies” in this way, his description of digital economic and political action illuminates many of the characteristics that are adaptive skills for individuals who want to effect political or social change in or through digital

networks. Tracing the narratives of a number of online political movements, Benkler formulates a model of collaboration that centers around the idea of “decentralized individual action” as a force with unprecedented power in digital networks (30). He writes that the *modularity* and *granularity* of peer production projects represent characteristics that successful projects have. That is, if a peer production project can be broken down into small components that can be worked on independently (modularity) and each component requires only minimal participation to complete (granularity), then networked projects have a higher chance of success (Benkler & Nissenbaum 2006). Benkler uses the examples of Wikipedia, the Free and Open Source Software movement, and political groups opposed to the use of electronic voting machines to show how these forms of “commons based peer production” have led to new nonhierarchical structures of interaction that provide alternatives to capitalistic models of coordinated action (Benkler 2006b).

Rainie and Wellman (2012) develop a model of new media literacies that focuses less on information or productivity, and moreso on the management of interpersonal relationships. These stem out of basic technical literacies with information and communication technologies, such as “graphic literacy” (an acceptance of the idea that sociality is experienced meaningfully via screens), and “navigation literacy” (understanding of the geography of online space). (2012, p. 250) They also include some similar notions as included in Rheingold’s model, such as “context literacy”, “focus literacy”, “multitasking literacy”, and “networking literacy” (p. 251). Finally, participants in new media spaces are additionally encouraged to cultivate their “ethical literacy” (p. 251). Rainie and Wellman frame their description of literacies within a broader framework of reimagining what an individual is in networked space (their model of “networked individualism”), and in so doing they frame literacies as a form of digital empowerment:

they know how to move adroitly through their network operating system - personal, institutional, and digital - without getting locked into one world. They follow the Golden Rule. They scan their existing networks for the possibility of gaining introduction to new networks that can expand their reach and diversify their sources of information. They strike useful balances between being “on the grid” taking advantage of opportunities and being available to help others, and “off the grid” when they need time to rebalance and contemplate without

interruption (pp.252-3).

Perhaps the most comprehensive examination of digital media literacies to date is the white paper “Confronting the Challenges of Participatory Culture: Media Education for the 21st Century” (Jenkins, Clinton, Purushotma, Robison, and Weigel 2006). Here, the researchers identify a wide range of capacities for interacting in digital environments, many of which (but not all) overlap with models already discussed (especially as regards networking and multitasking literacies, which seem to be common ground in all models of digital media literacies). They are: Play (experimentation as problem solving), Simulation (building and interpreting dynamic models of the real world), Performance (adopting alternative identities), Appropriation (sampling and remixing), Multitasking, Distributed Cognition (interacting with nonhuman actors that extend our thinking), Collective Intelligence (like Rheingold’s “collaboration”, this refers to pooling knowledge for collective efforts), Judgment (similar to Rheingold’s “critical consumption”), Transmedia navigation (related in part to Rainie and Wellman’s “navigation literacy”), Networking (very close to “network intelligence”), and “Negotiation” (our capacity to seek out and understand multiple perspectives, a distinctive and more detailed take on what Rainie and Wellman call “ethical literacy”) [2006, p.4].

Jenkins *et al* envision their project’s goals in ethical and institutional terms, with broad reforms to education suggested:

A central goal of this report is to shift the focus of the conversation about the digital divide from questions of technological access to those of opportunities to participate and to develop the cultural competencies and social skills needed for full involvement. Schools as institutions have been slow to react to the emergence of this new participatory culture; the greatest opportunity for change is currently found in afterschool programs and informal learning communities. Schools and afterschool programs must devote more attention to fostering what we call the new media literacies: a set of cultural competencies and social skills that young people need in the new media landscape. Participatory culture shifts the focus of literacy from one of individual expression to community involvement. (2006, p.4).

The spirit of “Confronting the Challenges of Participatory Culture” (2006) is (like that of

other approaches I have identified) a somewhat utopian, “solutionist” goal: to improve individual and collective competencies in digital networks for the betterment of society, presuming this can be done, in a positivist vein. But what is unique about Jenkins *et al*’s work is its nuanced account of the relationship of individuals and texts (which aligns closely with mobile interface theory, as discussed in the previous Chapter). While Rheingold’s “truth-seeking” disposition animates his account of new media literacies, his model reduces digital communication to that of an information processing or transactional model, which assumes that the goal and central concern of all communicative action is the reduction of uncertainty (Shannon & Weaver 1963). Benkler emphasizes greater collaborative implications than does Rheingold, but still rests his formulation for networked interaction on the notion of “radically decentralized individual action”, which is examined only in the context of technical achievements and political processes. Rainie and Wellman expand the scope of literacy to include more ethical and interpersonal dimensions, but the framing of literacies in terms of interpersonal and networked survival skills lacks attention to the role of media texts and other nonhuman actors’ agency within the new media networks. Jenkins *et al* (2006) acknowledge the role of texts through their emphasis on remix and sampling, while also expanding the ethical interpersonal engagements in their broadening of what is meant by digital media literacies.

For the above reasons, I find that the model authored by Jenkins *et al* (2006) holds the most promise for a broad understanding of a wide range of mediated and intertextual human interactions. However, in the model for digital media literacy I develop below, I will retain certain elements of the other frameworks insofar as they help elaborate and clarify certain features of the realities of geolocationally mediated everyday life. But first, the notion of location as a specific class of literacy demands more elaboration.

2.1.3. Locational Literacy, Knowledge, and Power

“Locational literacy” is not a new concept, though the formulation of it I am proposing is perhaps novel. Bill Green (2012) outlines a definition of the phrase in the context of literacy studies. Describing recent innovations in “place-based pedagogy”, Green argues that the socio-economic, racial, and locational differences between communities require us to include place in our consideration of how standardized educational models are

applied. Quoting Comber (2011), Green makes the case that “educational standardization ‘eclipses the importance of local knowledge’” (p.378). The work of Comber and others in “place-making” as a pedagogical model is instructive about the value of educational models that acknowledge place: “grounded in its milieu, or at least closely referenced to particular sites, or places of belonging and being, living and learning...these are places that matter, in a lifeworld that matters” (p.379). Green continues:

Places are defined not so much in and on their own terms (although they might well have their own specificity or particularity – they might feel distinctive, or are lived largely as such) as they are relative to other places. And since places are always realised in social space as much as physical space, they are not positioned equally, or distributed on a level plane, or playing field. Some places are more important socially, and also culturally and economically, than others; they may be bigger, or more prestigious, or powerful, and so on. Some may function as centres of reference in various ways for others, with the latter being distributed and defined as more peripheral. (p. 379).

Thus, in the context of education, the locational dimension has been recognized and integrated into innovative models for improving educational outcomes in specific communities. It has yet to be recognized in the wider discussion of new media literacies, however.

Nonetheless, the relationship of location to literacy is more generally (yet more comprehensively) articulated in the work of Michel de Certeau¹³, although he never uses the term “literacy” *per se*. In his most well known work, *The Practice of Everyday Life* (1980), de Certeau describes modern urban environments as texts that can be read by the individual subjects dwelling and moving about within them. De Certeau theorizes urban residents’ capacities for practicing everyday life by making a distinction between strategies and tactics. These describe, respectively, formalized and informal forms of

13 As noted in a previous Chapter, de Certeau’s work has already been valuable in the development of locative media studies, particularly in Farman (2012) and de Souza e Silva and Frith (2011). However, neither of these works explores de Certeau’s attention to different types of knowledge, which I do here. Intriguingly, Farman (like most scholars examining cities, space, geographies, and/or mobile interfaces) relies on de Certeau implicitly but never explicitly examines de Certeau’s contribution to this discussion.

knowledge and action.

Tactics, says de Certeau, are everyday practices performed by individuals that are improvised within a system to which they are subordinate. Tactics are actions that are typically informal, vernacular, and performed as routine. They constitute behaviours that are performed in order to accomplish everyday tasks, by individuals who are moving within broader systems or networks. Tactics can be conceptualized as immanent adaptations by individuals within systems or networks over which those individuals have limited agency to direct. Tactics represent a functional adaptation to environmental conditions that are beyond the direct control of those individuals.

De Certeau describes this possibility by referring to the relation between strategies (formal knowledge structures like science) and tactics (informal knowledge structures like rules of thumb). Tactical knowledge about one's world (for instance, vernacular understandings of how relations between people, objects, and environments can be predicted) are excluded by the strategic, official discourse of scientific knowledge. Science gives them no words, argues de Certeau. Science brackets them out and gives tactics no words in order to legitimate science as an official discourse, with tactical knowledge becoming the *ground* against which scientific discourse becomes the *figure*. Tactics, in de Certeau's formulation, are somewhat like the Freudian unconscious, or (as de Certeau argues) like the *ethnological other* as defined in early anthropological inquiries (such as Durkheim's). In this way, de Certeau depicts scientific and official discourses (strategies) as having a colonial relation to everyday, Othered, examined, or alien practices.

De Certeau further illuminates the relation of tactics and strategies by assailing two philosophical approaches to understanding the politics of society, culture and individual action. First, he examines Foucault's historiography of panoptic life (the rise of surveillance as a sociocultural norm) to draw out how strategies can be imposed upon individuals, and to portray constraints on individual agency or resistance within such systems. Foucault's analysis provides a discourse to describe the institutionalization of surveillance technology, which, according to de Certeau, can potentially work to turn the apparatus of systematic knowledge upon the institutions that bracket out tactics (i.e., tactical knowledge can represent a form of localized political agency). Second, he uses Bourdieu's concept of *habitus* (the complex of social and cultural patterns that give

structure and meaning to individuals' lifeworlds) to explain another dimension to the relationship between strategies and tactics. For de Certeau, Bourdieu essentializes local cultural practices by providing an externalized framework to explain them all – the habitus, which magically returns unspoken vernacular practices to the realm of knowability. In this sense, strategies can overwhelm localized practices through their property of being “known” or recognized within a system.

So for de Certeau, tactics and strategies exist in a kind of contest in which *knowability* and *formal recognition* perform decisive functions. While tactics have the potential to subvert the overarching structures (in part by virtue of their improvisational, recombinant possibilities), strategies work to assimilate tactics within ever-evolving, self-correcting, increasingly inclusive knowledge structures..

De Certeau describes tactics as “practices that cannot know what they know”. From here he develops the idea of “know how” (*savoir faire*, as opposed to merely *faire*, meaning practices without any knowledge). Technology, science and elite literature colonize these 'folk' practices, cutting them up and transforming them into knowledge within official discourses (pp. 50-70).

De Certeau's theoretical work can be helpful for addressing findings about locative media practices in their emergence, when they are still 'practices that cannot know what they know', or have not yet been incorporated into broader strategic projects. This is a helpful framework for explaining locational literacy. Locational literacy may be defined partly as not mere spatial awareness, nor merely knowledge of local spaces and places, nor merely the ability to read a map or use Google Streetview (one such broader strategic project). Instead, locational literacy represents a *capacity* for a form of knowledge that emerges in a context informed by, and increasingly dependent on a wide range of information sources, both local (vernacular) and global (official) in origin. The politics of locational literacy are constrained by the same forces of *knowability* and *formal recognition* around which the contest between official and vernacular knowledge turns. Locative media, then, create new sites for the renegotiation of power relationships, identity formation, and conceptions of publicity and privacy.

2.2. Locational Literacy, Power and Urban Space

As noted previously, locative media studies has thus far not provided a detailed account of the political dimension of the new locative media sphere. While Farman sets some of this groundwork in place with the notion of the “sensory-inscribed” nature of the smartphone as an interface, the implications of a “sensory-inscribed” interface as he defines it are not fully explored. To refine this I explore in more depth the work of Henri Lefebvre.

Lefebvre applies a Marxian critique of capital to an interrogation of space, specifically urban form. This unique project, spanning numerous articles, several books, and three decades, provides a wealth of theoretical resources with which to critique the particularities of contemporary cities in terms of the class dimensions of not just their physical infrastructure (dwellings, factories, transportation systems, and the flows of human actors and technologies) but also their communicative infrastructure. In this review of Lefebvre's approach to the study of urban forms, I focus primarily on Lefebvre's framework of spaces of representation, representational space, and spatial practices (1991).

Lefebvre's work is predominantly preoccupied with the implications of new forms of city life emerging in the mid 20th century. In *The Urban Revolution* (2003 [1970]) Lefebvre argues that in what he defines as the “urban” paradigm, we are in the midst of a “blind field” – that we cannot conceive of what the urban is, as we are always using outdated paradigms to classify and interpret the present and the future. So what we can look to are glimpses of the future, things that do not fit the model, things that are suggestive of new paradigms, inexpressible thoughts or visions.

Despite our difficulties in articulating the “urban paradigm”, Lefebvre saw the present (mid- to late 20th century) transition in the modern economy as dominated by it. For Lefebvre, urban form is a distinct economic phase from that of industrialization, characterized by the ongoing, recursive accumulation of surplus value in a global economy organized around distinctively post-industrial designs. No longer organized around settings like factories and populations like industrial labour, urban form is a kind of decentered space in which discourses of planning and centralization collide with (and sometimes collude with) discourses of destabilization. Urban form performs upon a city's

inhabitants by alienating, abstracting, and organizing them, but also represents a kind of heterotopia in which urban life “hovers, ambiguous and uncertain, between the interpretation of messages based on a (recognized) code and the metalanguage that is content to paraphrase messages that are known, repeated, redundant” (p.121). For Lefebvre, cities premised on urban (rather than industrial) form are constantly rewriting themselves. Crucially, Lefebvre also contends that while the urban form is dominant in modern technocratic life, there are nonetheless environmental limits to its development. Lefebvre sees ruptures in the urban form at the intersection of nature and cities – civic political struggles over parkspace, artificial representations of nature within cities, and the real environmental degradation upon which the processes of urban development ultimately feed all represent existential threats to its dominance.

Communication media are not the express focus of Lefebvre’s attention. At most, media operate within his analysis as spectacle insofar as mobile urban subjects are concerned¹⁴. While it is possible that, had Lefebvre anticipated the adoption of geospatial web technologies, these may have represented critical points of rupture to urbanization, and figured more prominently in his work. But it is not clear from this work on urban space whether it is possible to extend his analysis to contemporary tools and platforms without compromising his model of urbanization. That is, technologies of surveillance have evolved so significantly into architectures of control since the time of Lefebvre’s writing, it is difficult to conceive how his heterogeneous model of urban form would reliably accommodate such shifts without collapsing altogether.

Elsewhere in Lefebvre’s work, there are concepts which can be more usefully invoked in the theorization of locational literacy. In *The Production of Space* (1991), Lefebvre introduces a three part framework for social action in urban environments that resonates well with Farman’s idea of the ‘sensory-inscribed’. Lefebvre classifies our social action in urban space into three main genres of experience. First, *spatial practices* constitute our ‘deciphering’ of space – how we make sense of and use space in relation to our perceptions (of social roles, for instance). Spatial practices, then, comprise our interpretations of and interactions with space as a form of active dialogue with our environment. Second, argues Lefebvre, *representations of space*, or “conceptualised space, the space of scientists, planners, urbanists, technocratic sub-dividers and social

14 For instance, he derides the clamour of media in urban space as mere distractions in a single chapter in a later book, *Rhythmanalysis* (2000).

engineers” (1991: pp.38-9) are constitutive of definitions of space that descend from institutions of power and influence. Illustrative examples include official maps, satellite imaging, civic planning documents and programs, and engineering plans. Thirdly, Lefebvre describes *spaces of representation*, which he characterizes as the spaces of everyday life, comprised of both ideas of what's possible as well as material lived realities. Spaces of representation may be thought of in terms of Foucault's concept of the “heterotopia” - in which both material and mental things combine, and in which multiple interpretations are possible (unlike a one dimensional utopia or dystopia).

In Lefebvre's framework, spaces of representation and representational space constitute a kind of continuum of ideological subjugation and resistance in urban life. This closely resembles the de Certeauian distinction between *strategies* and *tactics*.

Farman's sensory-inscribed interface has the potential to operate upon all three Lefebvrian levels - of spatial practices, spaces of representation and representational space. Recall how the idea of *sensory-inscribed* draws attention to the multifaceted nature of mobile interfaces: as sensing tools, representational tools as well as identity-shaping extensions of our bodies. Firstly, as sensing tools, mobile interfaces are positioned to at once amplify our awareness of our environment while also constraining our perspective by demanding or narrowing our attention in various ways. Mobile apps have the clear potential to augment our experience of locations, which can help us to enact spaces of representation (wherein interpretations are multiplied). Conversely, apps can take on design forms that work to constrain us in oppressive ways: the familiar image of the inattentive pedestrian, focused on the high bandwidth mediated experience of a social media app, textual interaction, or Facetime session with some distant friend comes to mind here. In this latter sense, the individual becomes enframed in the strategic, representational space of the technical design.

Similarly, mobile interfaces as representational tools may lend themselves to either the constraints of representational space or the liberatory experience of spaces of representation. Where representational practices, such as geolocationally-tagged photography, take place, mobile users have the capacity to annotate their physical environments with vernacular imagemaking, inscribing their environment in empowering ways. Conversely, the collection and aggregation of geolocational data from photography in cloud based servers controlled by media corporations (like Facebook or

Alphabet, Inc.) constitute how representational practices can be incorporated into conceptualized space – wherein users become enrolled as points of information: rationalized, digitized, and made meaningful only with respect to imperial scale technical projects (such as Google Streetview, or facial recognition databases).

Finally, sensory-inscribed mobile interfaces as extensions of the body can be purposed in the interests of multiplying meanings for the individual as well. Where mobile interfaces open up new horizons of individual and collective experiences (such as the affordances of microcoordination or maintaining intimate contact with close friends and family) by amplifying our capacities for social interaction, then individuals may be said to be experiencing Lefebvre's idea of spaces of representation. Conversely, the modifications imposed on individual bodies as well as collectivities can also come to reflect the interests of the technocratic sphere of representations of space. The use of individual headsets or earbuds helps to alter the conditions of public interaction in ways that individuate, atomize, and alienate us from each other.

As such, the 'sensory-inscribed' interface has the capacity to produce relationships between individuals, and between individuals and space, in myriad ways. Lefebvre's framework helps to elaborate the political potentialities that are implied by the adoption of the 'sensory-inscribed' paradigm.

2.3. Critical Constructivism and the Politics of Interface

Thus far I have contemplated how theories of digital media literacies, urban literacy and the politics of urban space can be useful in articulating a theory of locational literacy. Another crucial element in this theorization involves an examination of technology as it is implicated in locational media and devices. A constructivist, phenomenological theory of social technology suggests that the meaning and definition of a technological thing is constituted in its use (not merely in its design). In the following section I will provide a constructivist account of the sociotechnical constitution of locational media.

Andrew Feenberg's critical constructivist theory assails our understanding the politics of structure and agency in technological design and use. To resolve the tension between social constructivist views (technology is what we make of it) and more essentialist approaches (substantivist or deterministic theories), he explains that while,

yes, technologies have designers with intentions, end users of those technologies make use of them in unintended ways¹⁵. Because of this, Feenberg argues that technologies are often underdetermined when designed, and micropolitical struggles are often waged in the re-articulation of their functions and meanings (similar to what Ling calls 'domestication processes'). Feenberg argues that this is always a political struggle, involving a tension between forces of domestication and agency on the one hand, and instrumentalization and systematization on the other. He develops these into a framework that includes primary and secondary instrumentalizations (2002).

Feenberg's framework complements the continuum of strategies and tactics discussed by de Certeau, but his theory is also consistent with a Lefebvrian re-formulation of the 'sensory-inscribed'. Feenberg is interested in essentially conscious appropriations of technologies by users, for instance the French Minitel system. While users adopted this in a vernacular style and put the system to use for things other than what designers intended, this kind of user repurposing happens within the context of a highly literate, interconnected, and reflexive consumer economy. So for instance, where new user hacks of Android or iPhone systems happen, they are typically shared rapidly and enter a subaltern terrain of more or less established discourses of political resistance. Hackspaces are one contemporary site for the origination of and discourse to give words to this type of user driven innovation.

De Certeau's *tactics* differ somewhat from Feenberg's rationalizations, in the sense that tactics go on without knowledge that they are tactics. They simply happen, without a vocabulary, as de Certeau put it. Feenberg's continuum more appropriately describes de Certeau's idea of "Cinderellas that science will turn into princesses", or the local artisans that introduce *knowing* into *tactics*, to establish the 'know how' (*savoir faire*) that eventually leads to their colonization by official discourse and knowledge. This

15 However, as Feenberg (2018, personal communication) points out, the relationship between primary and secondary instrumentalizations is not sequential. They always coincide. The relationship between them is more akin to a relationship between causative technical action (primary instrumentalizations, which act as affordances that are designed into technologies, primarily in the interests of efficiency), and cultural demands on techniques (secondary instrumentalizations, which express social and ethical prerogatives upon technologies as they are presented to individuals and groups).

is an intriguing insight: that practices emerge before they are named, and once named, they become colonized knowledge.

To provide a pair of brief illustrations from relevant contemporary discourse: prior to 2002 there was no well-known word like “selfie” that encapsulated the practice of photographing one’s self. Once the term comes into common parlance, it delimits and formalizes the practice of online-distributed-autophotography as a unitary concept. Similarly the word for “sexting” emerged to encapsulate a vernacular set of practices (sending sexual come-ons via text messaging) for which there was previously no single expression. A few technology companies, activists and artists, and academics all tried to create words for new practices they proposed, such as ‘placemarking’, ‘urban hacks’ and “footprinting”, respectively. The naming of these things and their adoption in official discourse matters. But these processes lack a *conscious political project*. Critical constructivism offers an opportunity for these namings to be incorporated into a conscious political project.

As regards the political implications of a critical constructivist project, Feenberg argues that while modern technologies are most often designed for authoritarian administration, they also bear democratizing potentialities. The concept of “democratic rationalization” emerges as a project to counter market rationalization (technological designs that deprive people of autonomy). In short, democratic rationalization is a call for individuals and groups to seize upon the liberating potentialities in underdetermined technologies (best seized in the earliest days of a technology’s existence) such that they establish a relation to technology that advances freedom and quality of life, but not on mere materialist terms of accumulation within the existing hegemony of capitalist society.

In so doing, Feenberg (2002) is careful to reject a traditional Weberian concept of “rationalization” to explain technology’s relation to society. The “new politics of technology” involves “progress of a generalized sort in speed, power and memory... while corporate planners struggle with the question of what it is all for. The institutional separation of innovation from social demand has gone so far that technical development finds no obvious path from engineering idea to marketable application” (p.103) [e.g. the underdetermination of French Minitel that allowed people to adapt it for their own purposes].

Feenberg's constructivism¹⁶ highlights the possibilities of agency and underdetermination in technical design and adoption. Describing how instrumentalization manifests in technical design in different ways, he describes both (1) institutional, strategic forms of instrumentalization and (2) vernacular, tactical forms: what he calls *primary instrumentalizations* and *secondary instrumentalizations*. Primary instrumentalizations correspond to "*functional constitutions* of technical objects and subjects". Secondary instrumentalizations correspond to the "*realization* of the constituted objects and subjects in actual networks and devices" (p.202). Feenberg describes this model as a means of escaping from the perils of substantivist and instrumental theories of technology, which, he argues, limit their analyses to merely the primary instrumentalizations of technology.

Feenberg outlines four forms of primary instrumentalization. The first two primary instrumentalizations derive from Heidegger's conception of the impact of technology on objects and subjects (Heidegger, 1977). The first of these, *decontextualization* refers to how technology reconstitutes natural objects and subjects as technical objects and subjects (Feenberg, 1999, p. 203). The second, *reductionism*, refers to how objects are purged of content that is technically irrelevant, so that all that remains of them are aspects that can be enrolled in a network as determined by a technical subject's strategic program (p.203). These instrumentalizations echo Heidegger's concept of "Enframing" (*Ge-stell*). By "enframing" is meant the technical organization of nature (Heidegger, 1977, p. 23) into "standing-reserve" (*Bestand*). By way of these substantivist-derived ideas, the first two primary instrumentalizations account for the conversion of natural objects into technical resources, concealing what they are and how they came to be (p.17).

In this framework, there are two further primary instrumentalizations – *autonomization* and *positioning*. These concepts are in part derived from the work of Jurgen Habermas (1971). The first of these, *autonomization*, refers to the feature of technical action (or "administrative action", in Habermasian terms), in which technology acts upon an object, achieving effects to which the object cannot or does not act reciprocally upon the technical subject. The second of these, *Positioning*, refers to the fashion in which technical subjects control objects according to laws or rules that are

16 This summary of Feenberg's concretization appeared (in a much more preliminary, abridged form) in a chapter in an edited volume [Hebert 2008].

inscribed into objects (and not by changing or challenging those laws). *Positioning* is a strategic maneuvering of the manager or authority to utilize the technical codes written into objects for their own advantage (p.204). Together, the four primary instrumentalizations comprise what Feenberg calls the “basic technical relation” (Feenberg, 1999, p. 205). The primary instrumentalizations account for substantive (Heidegger) and instrumental interpretations of technology.

Feenberg puts forward four secondary instrumentalizations to account for how technology becomes embodied in networks or devices: *Systematization*, *Mediation*, *Vocation*, and *Initiative*¹⁷. *Systematization* accounts for the reintegration of decontextualized technical objects into a network or device (p.205), following Latour (1993). *Mediation* refers to ethical and aesthetic features of technical processes, whereby technical objects are brought into line with moral or aesthetic objectives among affected groups or groups of users (Feenberg, 1999, p. 206). *Vocation* refers to how the technical subject is transformed by its actions, which works to reverse the effects of *autonomization* (p.206). Finally, *Initiative* accounts for tactical actions by individuals subject to technical controls (p.207). While primary instrumentalizations all constitute strategies that reinforce preexisting technical designs and imperatives, typically in accordance with the strategic interests of the technical subjects involved in their innovation, secondary instrumentalizations account for tendencies for ascribing meaning to and/or the adoption of technologies in (sometimes unexpected) ways that support the needs of groups and individuals who become entangled in interactions with (or uses of) technology. This framework represents the dynamics of cross-currents of agency and structure in a highly technologized society than that offered by instrumental and substantivist models.

Concretization is a programme for *democratic rationalizations* of technology. Concretization emphasizes strategies that “can adapt technology to the environment (and) the vocational self-development of its human operators”, among other human needs (p.220). In contrast with processes of differentiation, “concretizing innovations adapt them(selves) to a variety of demands that may at first appear disconnected or even incompatible” (p.217), incorporating the needs of progressively more and more purposes, or more and more user groups. Examples include “a solar house that gets its heat from the sun rather than from burning fossil fuels...internaliz(ing) environmental

17 These derive largely from the Actor Network Theory of Latour and Callon.

constraints in its design (p.217). Concretization is a process of synergization of the functional characteristics of technologies with the relationship of technologies to their environment and social milieu (p.217). Concretization is a reflexive process that can be built into technological design and innovation.

As with Lefebvre's theorization of the production of space, Feenberg's program for democratic rationalization can be productively mapped onto Farman's "sensory-inscribed" theory of interfaces. Farman's idea of *sensory-inscribed* draws attention to the multifaceted nature of mobile interfaces: as sensing tools, representational tools as well as identity-shaping extensions of our bodies. In all three dimensions of this definition of the interface, it is possible to conceive how both primary and secondary instrumentalizations operate. Administrative agendas (via primary instrumentalizations) are enacted in the functions of mobile interfaces, whether through *decontextualization* (transforming the individual into a technical subject, sensible only according to the logics of strategic production, as with the user who becomes a driver of Uber, for instance, on alert for potential rides or gigs, becoming a functionary of a broader corporate project), or through *reduction*, whereby an individual enrolled in some strategic project or other switches off notifications that are irrelevant to immediate strategic demands (such as a student switching off their audible [ringtones] or tactile [vibrations] mobile phone notifications in a classroom). Administrative, strategic agendas can also be enacted on the sensory dimension of mobile interfaces by way of *autonomization* (for instance, where transactional information is inscribed in locations, and technical design prohibits its removal, such as with Yelp reviews) and *positioning* (whereby, for example, mobile phone users 'check in' to locations to earn social capital, as in applications like Foursquare or Pokemon Go, while at the same time reinforcing the hard-wired value system inscribed into the code of the objects at hand in those transactions).

Feenberg's secondary instrumentalizations are also compatible with the more liberatory implications of the 'sensory inscribed' interface. *Systematization* may be said to occur with sensory inscribed interfaces in instances where users make unanticipated uses of device functions in the context of new network arrangements (such as the use of mobile hotspot sharing in the developing world, enabling low cost telephony initiatives¹⁸). More specifically, *Mediation* can refer to ethically or politically motivated uses of interfaces, against their intended use paradigm, such as documenting police violence

18 See Mesh Potato: <https://villagetelco.org/mesh-potato/>

with text messages (such as with platforms like Ushahidi) or with a cameraphone (such as the infamous use of Facebook Live in the documentation of the police killing of Philando Castile in 2017¹⁹). *Vocation* (which, again, reverses the effects of autonomization) may be in evidence where users are transformed by their interfacial actions (for instance, where users self-censor their location information in order to evade detection by employers, teenagers evading parental oversight, or travelers trying to avoid having their homes burglarized while they are away). Finally, *initiative* is evident in the use of sensory-inscribed interfaces where users tactically resist technical controls (such as by using an annotative app like Wikitude to record political criticisms of institutional power in the very locations where that power is spatially enacted (government buildings, for instance) in the form of locative, digital graffiti).

Of course, the terrain is complex. Not all (strategic) digital, location-specific billboard advertisements brainwash, and not all refusals to share our location are radical refusals of the dominant technocratic order – some are accommodative of older, sedimented regimes of technological dominance. That said, trading locational privacy for better bus schedules is embedded in broader networks of participation, implicating bus drivers and the managerial planning of transit authorities – surveillance and adaptive individual agency often work in tandem to produce (sometimes reproduce) an exploitative ordering of people and institutions. But the effects are unpredictable and only coarsely correspond to an overall capitalist objective. Within the cracks between the surveillance of bus drivers and the demands on them to meet schedules lie opportunities – albeit hidden, in cracks, after all – for resistance that demand (usually) vernacular actions. This can range from hacking or rooting a device to simple conversations between co-workers. Moreover, the prospects for social change enacted by individuals afforded agency over their self-tracking seem gaping and inviting (Google Maps mashups and citizen-driven big data initiatives, for instance), but the opportunities to exploit these opportunities are not equally shared, and therefore have great potential to reproduce technical-social orders in society, which may or may not correspond closely to the extant economic ordering of social classes in an urban context.

19 For more details on this tragedy and the subsequent acquittal of the police officer involved, see ABC News: <http://abc13.com/news/officer-acquitted-in-fatal-facebook-live-shooting/2108469/>

2.4. Locational Literacy as a Political Program

If, as I have argued, locational literacy is to be considered an emancipatory project, consistent with the envisioning of the model of digital media literacies in Jenkins *et al* (2006) and other formulations, then the political character of these hybrid environments requires more detailed elaboration. While the notion of the sensory-inscribed provides an adequate account of the multifaceted nature of mobile interfaces, its relationship to the politics of social action in hybrid spaces is less clear. The political theorization attempted here (mobilizations of Lefebvre's theories of space and Feenberg's theories of concretization in technological designs) illuminates the multifaceted ways in which locational literacy is a crucial part of our capacities to effectively engage sensorially and symbolically in a hybridized, mediated world.

To reiterate, locational literacy represents a capacity for a hybrid (strategically and tactically-informed) form of knowledge that emerges in a context informed by, and increasingly dependent on a wide range of information sources, both local and global in origin. Locative media, then, creates new sites for the renegotiation of power relationships, identity formation, and conceptions of publicity and privacy. Locational literacy can be mobilized as a primary locus for these renegotiations. By operationalizing the social production of space to inform locational literacy, it is possible to comprehend with better granularity the complex nature of our subjection to strategic projects, and our possibilities for resistance to such programs as they are structured by space and in established spatial relationships. By operationalizing democratic rationalizations as a project for better understanding the nuanced character of our micro-level engagements with interface technologies, we are better equipped to mobilize locational literacy in the environments in which we find ourselves.

Chapter 3. Research Methodology

In this section I pose the following question: what are the most promising methods for asking questions about geolocational media in everyday urban life, and in particular, questions concerning locational literacy as I have defined it? While it is helpful to examine previous empirical studies within mobile and locative media studies (and I do this here), it is also beneficial to consider this question from a more general perspective about what it means to know things. In particular, my research questions are directly aimed at understanding how individuals make sense of themselves and their worlds with respect to geolocational media. This orientation precludes some possible approaches to this fieldwork, and clearly points in the direction of a phenomenological approach.

It may help to put the particular methodological choices made here into some disciplinary perspective. While I do not purport to offer a comprehensive summary of the entirety of methodological orientations in Communication studies (which is a broad field including many divergent research approaches by any estimation²⁰), it can be useful for now to summarize some of the overarching ways of knowing that Communications and mobile media scholars have brought to the field. In this Chapter, I first explore the methodological demands of locational literacy that spring forth from the specific theoretical frame I developed in Chapter Two – a constructivist reading of the sensory-inscribed interface as a platform for locational literacy, as situated within the disciplinary context of Communication studies. Then, to provide context for the kinds of methods chosen for this research, I describe the practical constraints and considerations put upon the parameters of my research due to my involvement in The Greenest City Conversations Project (2011-2014), an interdisciplinary project examining communication, media, democratic deliberation, and sustainability. Finally, I describe the specific methods I use here (adapted in part from prior studies in mobile communication research) to investigate locational literacy as operative within a participant observation scenario, involving early adopters of locational media in 2011-2017 (the results of which are described and analyzed in Chapter Four), in addition to describing my app study and associated user experience surveys of values, attitudes and self-perceptions of mobile app users (Chapter Five).

²⁰ See Miller (2005)

3.1. Disciplinary Context: Toward a Phenomenology of Locational Literacy

In an attempt to create what he calls a “constitutive metamodel” for communication theory, Craig (1999) attempts to put forth a comprehensive view of the various conceptual domains that have had lasting and significant influence on communication studies: rhetoric, semiotics, phenomenology, cybernetic, sociopsychological, sociocultural, and critical theory. Despite some of the glaring omissions from Craig’s “constitutive metamodel” (the Media Ecology School, or Political Economy, to mention two), it is a useful overview that demonstrates some very basic contours of the discipline. This provides a basis for making some methodological choices at the outset of this study. Of the “conceptual domains” Craig enumerates, the semiotic, critical theory-based, and phenomenological approaches have arguably had the most to say about themes of emergence and indeterminacy.

Semiotic approaches have been instrumental in cultural studies for dealing with the problem of indeterminacy in representation (Hall 1980). Critical theory (primarily through the works of Adorno & Horkheimer, Marcuse, and Gramsci) has sought to destabilize conventionalized understandings of mass media by positioning them as social organs that work to reinforce or undermine oppressive institutional structures. Phenomenological approaches – in particular, symbolic interactionist theory – have enabled researchers in communications to probe deeply into the sense-making practices of individuals and groups as they come to understand and adapt their behaviours in changing environments. Symbolic interaction theory has had a profound influence on not only the conceptual preoccupations of the discipline, but also on the practice of fieldwork.

Semiotic theories have been applied to the study of the “writing” of urban space, particularly in the analysis of graffiti (many authors, following Baudrillard 1993), glocalization (Krase & Shortell 2011) and in tourism studies (Metro-Roland 2011). Semiotics is also clearly influential upon the work of de Certeau (1980), whose work informs the present study. Indeed, the study of meaning making through the practices of “reading and writing the city” is an essential building block in any theory of “locational literacy” such as I am proposing.

Thus, semiotics plays an underlying role in some of the premises of this study, though I do not perform any specific semiotic analyses of any particular texts *per se*. As with many previous studies in this area, the influence of semiotics is acknowledged but not foregrounded as part of a formal empirical methodology. In this research I accept as a basic premise that physical and digital environments have textual characteristics that permit differential and conflicting readings of them. However, my focus is more on the *practices* of perceiving, interpreting and inscribing of meaning in spaces and places than on the inscriptions themselves.

Phenomenological methods seem to be more promising as an explicit methodology for locative media studies. I already examined Farman's "sensory-inscribed" interface and de Certeau's idea around tactics and strategies, in the formulation of the idea of "locational literacy". As I conclude there, our entanglements with urban environments are afforded new sites in mobile media for the development of tactical and strategic knowledge frames, and these new sites are where phenomena come into being as a result of the mutual constitution of individuals, their interfaces, and their urban environments. Locational literacy is a capacity for effective survival and political agency that is grounded in practices that inculcate location and spatial consciousness. Locational literacy may be expressed in terms of mediated, tactical vernacular practices with location based media, and they may also evolve into translocal literacies, through strategic projects like Yelp, Google Maps, Google Streetview, and trip-tracking apps.

Critical theory also plays an important role in the present study, as my research questions do ask about power relations and structures with respect to everyday use of geolocational media and data. Prior studies (notably Farman 2012) of geolocational media have discussed the work of Gramsci in relation to this topic. I will address this in my analysis, but I find that the work of Andrew Feenberg on concretization to be much more helpful in terms of a framework for action and change. In Chapter Two, I concluded with a re-framing of Farman's approach to the shaping of political power in mobile media through a lens of Feenberg's concretization – an attempt to more carefully map out the political landscape of mobile media use, in terms of primary and secondary instrumentalizations.

3.2. Practical Considerations: the Greenest City Conversations Project

The foregoing sets some parameters within which the present empirical inquiry takes place. This empirical research seeks to identify and disentangle everyday practices with the use of geolocational media and devices, and therefore focuses on intimate, habitual practices over an extended period of time.

As my research was funded and administered within the context of the Greenest City Conversations Project, there were many practical considerations for and limitations on how my research could be framed. The Greenest City Conversations Project was a multi-institutional, interdisciplinary, collaborative study of dialogue about environmental sustainability in the Metro Vancouver region. The structure of the research involved multiple media “channels” (explored by multiple teams of researchers and graduate students) as sites of analysis of the nature and character of public discourse within each media channel. Channels included table top games as a site for modeling ideas about sustainability, social media platforms as a site for reasoned discourse about environmental issues, environmental modeling software as used in civic discourse about planning and sustainability, interactive theatrical performances as an incitement to dialogues about sustainability, and mobile media as a site for both dialogue about and live feedback regarding environmentally sustainable practices. The latter channel was where the team I worked within focused all of its attention.

Over several months of consultation with the GCCP research group, the structure of a research program for the role of mobile devices in sustainability themed dialogues was negotiated and designed. The research was designed to proceed in two phases: (1) an initial ethnographic exploration of the role of geolocational media in everyday life, and (2) the implementation and field testing of a mobile app that facilitated sustainable behaviours, thinking about sustainability, and dialogue about sustainability.

Practical considerations (timing of research funding and report deadlines) limited the initial ethnographic study to a four month period. Other practical considerations (budgetary matters, the degree of intimacy required to observe repeated habituated behaviours in participants) limited the initial ethnographic study to a maximum of five participants. Various methods (described below) were developed with a focus on

intimacy, self-reflection, and immersion into participant-driven phenomenologies. The interviews were scripted in such a way to invite dialogue between participants to discuss how geolocation matters in terms of their use and understanding of space and place, as well as the political shape of urban life as mediated by geolocation and transportation.

In addition, practical considerations (the obligation to produce iterative research that fit the objectives of the GCCP project) necessitated the use of participatory design in my fieldwork (i.e., the research subjects helped inform the design of a mobile app, the use of which was researched further). Participatory design is aligned with the aims of critical theory - to interrogate and upend oppressive practices in product design, which is usually carried out solely for the benefit of multinational corporations' profit. In this instance, the design was initiated in order to produce an application that could provide feedback to app users about the environmental impact of everyday choices, and that could encourage dialogue about sustainable transportation practices.

The trip-tracking field study (described in much more detail in Chapter Five) permitted the observation and analysis of a larger pool of participants (sample sizes of 33 and 22, respectively), but with much less granularity. Participants completed a survey questionnaire about their perceptions of space, place and mobility, and provided open-ended feedback about the experience of using a trip-tracking, greenhouse gas calculating mobile application. Survey questions probed attitudes and values toward city life, mobile and geolocational media use, and transportation, and were conducted prior to the use of the app as well as after using the app for a period of two weeks.

3.3. Ethnographic Method in Locative Media Studies: Communication Diaries and the “Naturalistic” Approach

The study of locative media is now a maturing interdisciplinary field. Much of the early fieldwork in locative media centers around the experiences of geolocational art projects and location-based games (Gordon and de Souza e Silva 2011). More recently, as de Souza e Silva and Sheller (2015) recount, the field of Mobility studies has grown to involve a diverse, interdisciplinary set of approaches and loci of field research, including user experience studies of location based services (LBS), examinations of the global mobility of people, goods and information (following Castells 2000 and Sassen 1998, primarily), alongside the longer history of communication scholarship concerned with

mobile phone use (2015, pp. 1-6). There is now a diverse set of theoretical and methodological approaches to mobile and locative media studies documented in the literature. For the purposes of the present study – an examination of how geolocational media users understand their environments personally, perceptually, and politically, which requires a detailed, intimate, and participant-driven, emic description of everyday life – this suggests a very particular approach, that has clear precedent within locative media studies. I draw on two prior research designs in order to construct mine here: the “communication diary” approach and a “naturalist” framework of knowledge.

Among some of the earliest fieldwork in mobile media to focus explicitly on locative practices, Ito, Okabe, and Anderson (2009) examined mobile device users in three cities (Los Angeles, Tokyo, and London). The researchers used a “communication diary” model of data collection. Participants were subjected to interviews, diary-keeping, and ‘shadowing’ sessions by the investigators (p.69). In recording the “social transactions” of research participants this way, Ito *et al* were able to interpret three dominant “genres” of urban mobile-mediated experience involving space: cocooning (the use of mobile media to insulate one’s self from their immediate physical surroundings), camping (the tactical repurposing of space for work or play purposes through the deployment of mobile media), and footprinting (the leaving behind of a digital trail of interactions in space through transactional data) (pp.73-83). By using the “communication diary” approach, the researchers were able to reconstruct detailed accounts of everyday locative use, and to compare their findings across three distinctive urban cultures.

Liao and Humphreys (2015) adopt what they term a “naturalist and interpretive” framework for analyzing a group of Layar users (with respect to their perceptions and experiences of space and place). Drawing on de Certeau for the formulation of this method, the authors argue that permitting their research participants to construct the categories or genres of experience gives them a more detailed and reliable glimpse into their everyday lives than would otherwise be obtainable (pp 22-24). The authors also were able to allow participants to articulate *emic* categories of experience (as opposed to *etic* categories superimposed by observers), as is standard ethnographic practice.

To a large extent I adopt the “communication diary” approach described by Ito *et al* (2009). I also devised interview scripts with a “naturalist” sensibility, following Liao and

Humphreys (2015). So much of the current research into mobile media focuses on interviews and surveys with individuals, and there may be some concern expressed that this leads to understandings of mobile media use that overemphasize individual experiences. To counteract this possible effect, I chose to conduct group interviews as much as possible. Also, because the conversations were premised on a group dynamic, I began the group interview sessions with an aleatory exercise of sorts – a “Smart LEGO” session, during which participants built reconstructions of their home neighborhoods with LEGO, and compared their constructions to start the dialogue on how we read and write meanings into space and place.

Recruitment of knowledgeable research subjects (knowledgeable about locational media, that is) was also a necessity. As Sam Ladner writes, the principal job of an ethnographer is “to find participants who offer the greatest potential for understanding the phenomenon at hand” (2014, p.102). In 2011, I sought research subjects who had direct, conscious experience with geolocational data on an everyday basis. Individuals who had already made use of geolocational data in some way – whether by creating digital maps of their own experience, geotagging photos or videos, playing geolocational games, or using tracking apps. In 2011 (when the latest iPhone was the iPhone 4, the newest Samsung Galaxy was in version 5, and RIM’s Blackberry was still a competitor in the Canadian handset marketplace), this proved to be a small group of people in Metro Vancouver. As I began to informally inquire about participation in this study among my contacts in the local wireless and new media industries, I soon learned that conscious use of geolocational data was largely the domain of a few startup companies, software engineers, and hacker groups.

Therefore, my research subjects for the participant observation study eventually included a freelance software engineer, an urban planning student studying transportation systems, a social media blogger/journalist, a UX designer and local software industry veteran, and a film student. Fortunately the group was almost gender-balanced (two female, three male), which is often challenging in IT industry circles, for systemic reasons. The group was also somewhat ethnically diverse – only two subjects were of Western European descent, while one is Filipino, one Chinese Canadian, and one Japanese American. All subjects were born in Canada or the United States, and their shared first language is English (though two of the five speak multiple languages).

This demographic description is in no way a representative sample of conscious geolocational media users, but this is not predictive, probabilistic research.

The overall goal with this mixed methods approach to ethnography was to reach what Anselm Strauss and Barney Glaser call the “saturation” point - “the point at which you begin to hear the same information repeated” (Ladner 2014, p.105). To effect this, the ethnographic research conducted here was structured to gather information on not just five individuals, but on many data points – situations, locations, conversations, hours, minutes, photographs, activities, wiki entries, digital geolocation logs, and manually created media logs.

3.4. Summary

The present study is situated broadly within phenomenological, critical theory, and semiotic traditions that are commonplace within the field of Communication studies, and mobile communications studies more narrowly. The epistemological demands stemming from the framework of locational literacy as I have developed it also provide impetus for the adoption of a broadly ethnographic, phenomenological approach to empirical enquiry. Prior methodologies in mobile and locative media studies provide a model for doing participant observation with locative media users; in particular, a mixed methods approach involving group interviews, accompanied sojourns and communication diaries is most helpful for developing depth of interpretation of individuals’ choices, preferences, values and beliefs as they go about their everyday lives with locative media at hand. Finally, the practical considerations of the specific research context – the Greenest City Conversations Project – set up a number of logistical and practical limits on the research settings accessible to me.

The pair of research efforts narrated in the next two Chapters – the participant observation with early adopters, and the app user experience study – are helpful for the purposes of the present inquiry in that they are complementary, and attempt to obtain answers to related questions about locational media literacy from different angles. In the participant observation study, there is ample opportunity to ask questions about why certain choices may be made, how participants identify, define, and make effective use of locational media and interfaces in their own terms. The app user experience study allows nothing of that granularity, but instead provides a more systematic overview of

preferences, values, and understandings with a larger group of users in a very specific - and designed - locational media context. While the ethnographic research offers an in-depth look at how people make sense of locative media, and incorporate that into understandings that resemble locational literacies, the app study offers a structured situation for examining how individuals respond to a specific set of locational media parameters, and looks for how they might adjust their behaviours and stated values and preferences in response to that situation.

Chapter 4. An Ethnography of Early Geolocation Data Adopters (2011-2017)

Geolocational digital media have a special relationship with cities and the people who live in them. This relationship is defined by the opportunities afforded to and constraints imposed upon the perceptions, memories, and political power of the people engaged with them. First, our perceptions of place, space, and pathways through a city are structured by layers of information which we are variously attentive to, depending on our purpose and orientation in and about a city. Certain features become more visible, and thus inscribed with important meanings, when they are incorporated as necessary or interesting points of interest with which we interact. This is affected by many factors, not limited to: mode of transportation, present and historical relationship to the locality in question, and media at hand. Second, our memories and histories that have distinct place associations work to structure our experiences in urban space in very powerful ways; this fact implies that memory assistive applications are a very potent site of opportunity and innovation that should be handled with delicacy. Third, our use of locative media in urban space is structured by our subject positions with respect to gender, race, and social class in ways that are often made invisible by the rhythms of everyday life. The unspoken rules regarding who is permitted to survey whom or what, and for what purposes, constrains geolocational media use in ways that has political implications for an increasingly mobile, and increasingly interconnected, and surveying society.

In a previous chapter, I review the research into geolocational media and identify limitations within this prior work pertaining to this latter question of politics. I then attempt to provide a fresh perspective for understanding the new politics of space and place as they are mediated through digital geolocational devices and media, using a critical constructivist framework. In the present chapter, I explore these three dimensions of geolocational life – perception, memory, and politics – with respect to an ethnographic engagement with five early adopters of geolocational devices. Data collection proceeded in two phases: an initial series of interviews and participant observation sessions beginning in 2011, and a follow up series of interviews in 2017. A total of 449 minutes of audio and 323 minutes of video documentation was obtained and transcribed. In

addition, participants recorded their experiences using multimedia recording, mapping applications, and personal observations written up on a shared wiki. In sum, this study involved a group civic modeling exercise (using LEGO), seven group interviews, ten participant observation sessions, two weeks of media use logging, and analysis of textual, video and map narratives created by the participants about their experiences as commuters in Vancouver. Finally, participants were interviewed again in 2017 (in individual and group interview settings) to reflect on their prior experiences as participants in the study.

The results from this ethnographic study, as I will show, provide a cautionary tale for geolocational application development. The accounts and experiences of my research participants provide a rich descriptive background for identifying some of the most important opportunities for future innovations, as well as pointing to some of the potential pitfalls in such pursuits. Moreover, the analysis here provides insights into how locational literacy may be identified in observations of everyday urban life, and how individuals make sense of their sense-making of interfaces, communities, and the built environment around them.

4.1. Process

Participants were briefed on the purposes of the study, and helped determine a schedule of group interviews and individual participant observation sessions over the initial four month period in 2011. This schedule proceeded as follows:

1. Initial group meeting
2. Smart Lego group community modeling session.
3. Media use debriefing group meeting
4. Individual Interviews
5. Participant Observation sessions (individual)
6. Wiki writeups and reviews
7. Participant observation/wiki review meeting

8. Documentary and Final Review Meeting

9. 2017 Follow-up Meetings

At the initial group meeting, the research objectives were discussed and the topical terrain was explained to participants, and informed consent was obtained. In second group session, each participant was asked to model their neighbourhood or their commuting path using a large box of generic LEGO. This was meant to stimulate discussion of participants' observations, perceptions, feelings, and values associated with their habitual actions in the urban space of Vancouver, during a semistructured group interview following the modeling. Participants were then provided with a communication diary form to fill out over a one week period; participants were asked to record all their uses of media, noting the location of use, amount of time spent with each medium, and medium itself (everything from text messaging, voice calls, GPS, radio, books, television, cinema, and many more). Several individual (semistructured) interviews were conducted following this, in which participants who had missed one or part of the previous group interview sessions were able to articulate their reflections to me. Communication diaries were submitted ahead of a third meeting, during which participants were prompted to reflect on their experiences of documenting their media use, and the relationship of these actions with location, again, in the context of a semistructured group interview. All of these group meetings were audiorecorded and transcribed.

This was followed up by a series of accompanied sojourns, during which I traveled with each participant along a route through the city of their choosing; participants were instructed to choose a route they habitually use. These sessions were videorecorded and transcribed. Participants were then instructed to create a documentary (in a medium of their choice, whether annotated digital map, video, photoessay, or audio narration). These were uploaded by each participant to a shared wiki. Participants were then asked to review and comment upon each others' documentaries. This was followed by a fourth group meeting, during which participants discussed the documentaries and how they enhanced their understandings of the relationship between individuals and the spaces they inhabit. This was followed up by a final group meeting, wherein we discussed lessons learned, and recommendations for

the GCCP mobile app (described in Chapter Five). These latter two interviews (both semistructured group interviews) were audiorecorded and transcribed.

Transcribed data were coded, and analyzed, and this was utilized in other research initiatives (including the trip-tracking application design discussed in the next Chapter). A summary of the 2011 data was written up and provided to participants, outlining passages of dialogue and monologue that correspond to the three main identified thematic areas of the study: perception, memory, and politics. This was used as a prompt for a retrospective semistructured group interview conducted in 2017 (along with individual interviews as needed). These latter interviews were conducted to verify and clarify meanings, as well as provide an update on participants' feelings and observations, especially in the light of technological and social changes that have taken place in the six intervening years.

4.2. Research Findings: Themes

As the research unfolded, three predominant themes emerged, recurred time and again in the varied ethnographic encounters: (1) *perceptions of the environment* as related to a range of different social and technical factors in one's experience, (2) the special role of *memory in the mediation of individuals' relationships with locations*, and (3) the *political dimension of location*. In the following section, I synthesize the many findings that fall under each of these themes. At the end of each section, I discuss the implications of these findings for the application of a constructivist-oriented theory of locational literacy.

4.3. Perceptions of the Environment

On the level of immediate perception – referring to what is legible, relevant and noticeable in an urban resident's vision of their community (and excluding things that are not legible, not relevant, and perhaps unnoticed by an urban resident on an everyday basis), the Smart LEGO exercise proved to be a productive conversation-starter for participants. Participants' auto-documentaries are also instructive about questions related to this theme. Most of the insights into perceptual matters below refer to these sources of information. Insights into perception include: (1) how modality of transportation affects what objects or features are visible or legible in the environment; (2) how the presence of a media recording device affects the behaviour of other people

in the environment, which contributes to an environment that produces different perceptions; and (3) how perceptions are shaped by familial and institutional relationships that an observer has in their community (with home, work, friendship, and family spheres, among others).

The group very enthusiastically constructed models of their neighborhoods using the LEGO (Figure 1), and were very inquisitive about each others' creations as they worked. This was an excellent ice-breaker for people to inquire and disclose about each others' commutes and other ways of getting around the city.



Figure 1: "Smart LEGO" session begins

Over time this talk transformed into squalls of conversations about strategic urban planning, and how often it seems to be out of touch with concerns of residents. Notably, these conversations took hold as early as 18 minutes into the meeting, while LEGO construction was still in its early stages (perhaps a testament to how productive this kind of modeling exercise can be). Here, several participants lament the level of engagement between civic institutions and citizens with the planning – and even naming or labeling – of neighborhoods:

Roland: *Adults are too jaded, they don't want to be playful with their city. Which I think is wrong...they don't want to connect their community, they're just too tired...you know, crazy job, crazy life.*

Karen: *Where did the pirate with the peg leg go?*

George: *Where's the bridge?*

Roland: *Oh, that is awesome. The Canada Post.*

Karen: *Should we have a pirate with a peg leg by City Hall, maybe?*

George: *That's interesting.*

Karen: *We'll see.*

Facilitator: *They already have emblems for a few different neighborhoods. If you go to Davie Street, and there's all the rainbow signs, and you go on the Drive and there's signs there.*

George: *Are those emblems? Those are more of like, or flags?*

Facilitator: *It's the same thing, right?*

Roland: *Same idea. Those things have emerged...*

Facilitator: *Organically?*

Roland: *I think, with some kind of subtle reinforcement from the city, right?*

Facilitator: *Right, subtle encouragement.*

Roland: *Yeah....Maybe there you have an example of a citizen experiment that's a little too formalistic.*

Here, the participants make a connection between their own reconstructions of their neighborhood with attempts by the City of Vancouver to develop brand identities for various neighborhoods in the city (which has involved the installation of branded flags on civic infrastructure). Very quickly into the session, then, participants were identifying

parallels between their own simulated planning exercise and the dilemmas faced by urban planners in organizing neighborhoods for residents.

One of the participants picks up a few LEGO chicken figures, which launches a discussion about some more liminal urban residents – nonhuman animals – and their interactions with the activities of human residents:

George: *This is Main Street. Are there any backyard chickens on your commute?*

April: *Backyard chickens?*

Scott: *No, not on mine.*

Facilitator: *On Woodland, there are.*

Roland: *I know, but I never see them.*

Facilitator: *I've heard, It's at Eighth and Woodland?*

Roland: *That's right. I've seen it, I've taken pictures of it but I've never seen the chickens.*

Facilitator: *I'm just wondering if they're being eaten or something. Somebody's stealing them...*

Roland: *It's a menagerie populated by hobbyists, like yourself.*

Facilitator: *I don't know about a menagerie...*

Roland: *Isn't there one [episode of Star Trek] where they're calling human beings a part of the intergalactic zoo?...it's a famous science fiction movie.*

George: *Oh, yeah, like the first Star Trek?*

Roland: *Yeah. Yeah, the first one.*

Here, participants use the prompts of the modeling materials to realize previously unarticulated dimensions of urban experience. This, again, is a testament to the utility of the LEGO exercise in expanding topics of conversation, and in stimulating brainstorming. Connections are then subsequently made between the possibilities opened up by considering nonhumans in the mix with speculative fiction utopias (or dystopias – the “intergalactic zoo of Star Trek” reference). It is also noteworthy that, as observed by the participants later, the legibility or visibility of urban wildlife is mediated by transportation modality (in this case, being a cyclist in the neighborhood in question is what revealed this phenomenon).

Another moment where the physical modeling works to prompt discussion occurs around the subject of schools:

April: *I actually have a park near me.*

Roland: *I was going to make a school.*

Karen: *Is this the park, with the coffee mug on it?*

Roland: *Do you have any blocks like that? I can use that for the school.*

Karen: *Like, what do you mean, like these blocks?*

April: *Yeah, they are hard to find.*

Roland: *The under-funding of schools.*

April: *[laughs]*

Facilitator: *What is it? This one?*

Roland: *Yeah...What I've omitted from this is the SUVs from the Catholics. This is Simon's public school, and then right here there's a Catholic school...I don't know what it's like. It's like an airport in the morning, when people are dropped off, people to go on flights, except they're not dropping off kids to go on flights. They're dropping off the kids to go to Catholic school, and they all have huge cars. No one drives small cars and drops their kid off to school. Or maybe, they*

just dominate and you don't see the small cars, because you're dodging the huge ones, on your bicycle? You know? I don't know.

Here, the participants center their concern on the rhythms of use of their neighborhood, using one transportation metaphor (airport dropoffs) to explain another (SUV school dropoffs). This prompts more discussion about the use of automobiles in cities.

As a participant in the conversation, I related a story about a dog-walker who let his dog defecate in our yard – I wanted to prompt the discussants to think about themselves as more than just commuters – in the story, the person walks his dog (which requires that he be a pedestrian), but then when caught not cleaning up after his dog, he walks the dog home, and returns in an SUV, bags up the excrement, then drives off. I pose this to the discussants as an example of the kind of micro/everyday actions we engage in that require transportation modality shifts. For the dog-walker, his use of the SUV in this absurd way is actually connected to a longer game, likely involving a commute. However, the use of the automobile was tactical, and done in response to a novel situation. I then asked the participants if (and if so, when) situational factors ever forced an impractical, tactical change in modality (of getting around) like this.

In response, they started placing SUVs (little Lego cars meant to represent them) parked on every street. My prompt did not have the anticipated effect, unfortunately. It simply seemed to lead them to think about SUVs in a negative light.

Then, participants proceeded to each describe what they'd built. At first, April observes the following (to which Karen adds an intriguing insight):

April: *You know, I really notice how everyone else is so beautifully manicured, versus downtown, it's like, whoa. [laughter]*

Karen: *Ironically, yours is also the one with all the people, which I think makes sense...*

George then describes his creation (Figure 2). He has constructed a scale model of the Skytrain station he uses most frequently, near his home in Coquitlam. He describes it in negative terms. He doesn't look around at the details of his surroundings because the process of commuting is so unpleasant and bothersome. He tunes himself out.



Figure 2: "Smart LEGO" session: George's neighbourhood model

Thus, he's modeled a familiar, memorable structure without much human scale detail. He dislikes his commute to Vancouver, as he finds buses unreliable and the commute frustrating (e.g., waiting around for an hour for a bus) and time-consuming overall. as evinced in this passage:

George: *I guess, for me, Lougheed is kind of...I very much feel like I live downtown 90 percent of the time. I feel really a part of the city, so I really hate Lougheed, especially because my boss might come once every hour.*

Facilitator: *Do you hate that it shows you how far you are from the city?*

George: *I think so, and then for all the times I've been stuck waiting for a bus for an hour, trying to catch this bus. Which makes me wonder why I took such painstaking detail to commit it. [laughter]*

Facilitator: *Because it's so vivid in your mind.*

George: *I guess so, yeah. I don't really know what else... [laughs]*

As there is a close relation between the insights of George's modeling and his auto-documentary, I review his documentary here. Note that the auto-documentary was created several weeks after the modeling exercise, but some of the same themes are

raised, which offers some further explanation of how George makes sense of his relationship to places in the city.

George's Auto-documentary

Using the Zeemap application, George identifies 24 points of interest (hereinafter POIs) in his neighbourhood, spanning a rail commute from Rupert Street and Grandview Highway to Waterfront station, and two pedestrian sojourns: (1) from Waterfront station southwest to Robson and Burrard, but also East-west to Carrall Street along Hastings, and (2) from Broadway north-south along Commercial Drive as far north as East 3rd Avenue. George identifies two university campuses (both SFU), one art gallery (the Vancouver Art Galley or VAG), a sword fighting academy that doubles as a dance studio, 3 transit stations (all rail), 14 eateries/cafes, and one movie theatre.

George makes a note about the VAG that suggests that its function as a public gathering place for mass demonstrations or mobs (420, Zombie Walk) is more significant to many than is its interior. It is surely partly the design of a building or square that encourages people to congregate and/or organize/mobilize in public (indeed, the VAG is the starting point for most political demonstrations in Vancouver, as well as the site of the 2012 Occupy camp).

George's description of the spaces he occupies are not atypical for a film student in Vancouver: gathering places for fellow students, lunch spots, spaces where large groups of people congregate for various purposes, cultural events such as slam poetry nights, and a blues dance club. Much of his orientation to the city, he notes, stems from the fact that he only recently moved here (i.e., living here has different implications in terms of what POIs are regarded as important in the spaces we move about in. As a visitor, he took in locations meant to draw in visitors).

Just as do gender, race, and class, length of tenure of geographic residency attenuates the experience of an urban setting.



Figure 3: George discusses the experience of walking in Gastown

George's modeling and auto-documenting attest to the idea that familiarity (and memory) inscribe meaning in places. Where institutional inscriptions are the only resource in the urban space being contemplated (as is the case with George's commute, by his own account, there isn't much value placed on the neighborhood besides the utility values of reliable transport, or ensuring one can arrive somewhere on time.

Roland's auto-documentary touches on how familiarity and tenure can inform participants' ideas about perception, information layers and the urban environment. But as I discuss, Roland's example introduces a number of other considerations: cameraphones, transportation modality, and infrastructural elements as they affect locational literacy.

Roland's documentary is a bike-mounted, narrated video-documentary of his cycling commute through the city. It is a bright, sunny day, early in the morning. Long

shadows appear cast from an east-southeasterly direction. Roland begins in a “suburban low rise” part of East Van, on his home street. The noise of his bicycle obliterates any narration he may be making. He checks his camera again at 12th and Woodland. He asks a pedestrian “did you press the button” (referring to the pedestrian and cyclist-operated streetlight), as he is too preoccupied with figuring out his bike-mounted camera to operate the button.



Figure 4: Roland negotiates cyclist traffic on Union.

At Broadway and Woodland, he stops for a red light again. He interacts with another cyclist (female), asking her if she has a laptop in her panniers (he’s looking for a laptop pannier – hers is not that). He stops at Woodland and North Grandview and comments on how it’s a dangerous intersection. He continues on, sailing through 4th Avenue, and a roundabout at 3rd Avenue. He notes that there’s a jogger on the road.

He stops at the light at 1st Ave, and checks the camera again. He continues on through. There is little traffic. Roland turns along the designated bike route, left on Kitchener, right on Maclean. He stops at Venables for a red light. He then continues on, “signaling left”, turning westward on Union (Figure 4), among many other cyclists.

He almost runs the stop sign. He stops suddenly, well into the intersection, and has to turn around. Another cyclist, male, stopped at the stop sign, reminds him that there’s a stop sign. They have a brief, pleasant exchange, wherein Roland claims he was mesmerized by the spandex pants on the speeding cyclists who ran the stop sign just ahead of him. Roland is good at turning what could be a confrontation into a pleasant exchange here. He continues westward on Union, passing a few cyclists, gaining speed. He stops at Gore, then continues on. Vehicular traffic is interspersed with this part of the commute (notably, this street was revamped since 2011, so that the parked vehicles act as a buffer against the cycling lane now), until he arrives at Main Street, where there’s a bike zone in front of the stopped car traffic. Then he crosses onto the Georgia Viaduct, into the bike lane. There is no other bike traffic on the viaduct. He hits green lights into downtown, and there’s much more traffic – both bike and car. He turns north on Cambie, stops at a red light at Pender. He then continues across the intersection, down to Hastings, where his workplace is. He calls out to someone he knows when he arrives, and lets him know he’s on camera.

Roland never rings his bell, but he verbally interacts with many people along the way. He also uses hand signals to communicate with vehicles, other cyclists and pedestrians along the route. Roland’s commute is rich in informational resources that are both objects (infrastructure, technologies) and subjects (individuals), but his interactions are given a bit more insight when considered in the light of how he models his commute in LEGO. I return to the LEGO modeling session (several weeks previous to the bike ride just recounted) to discuss these matters. In particular, Roland’s actions and perceptions of his environment are a clear indication of how perceptions are altered due to the use of photography.

In his LEGO model, Roland depicted the entire cycling route from his home to his workplace (Figure 5). He mainly emphasized the inordinate number of SUVs parked in his neighborhood, and around his child's school:

Roland: *I live in East End, and this is Clark Park. This is the Catholic school next to Clark Park. These are the SUVs lined up to drop off the kids. There are usually SUVs. When you see a normal-sized car, you're like "Oh, wow. People drive normal-sized cars." This is my son's school where I take him... There's SUVs as well (indicating SUVs in the model he's built), but just not as many...Here's my commute. I go down Woodland, past Chinatown. Here's Main Street, and I go up there by my little bicycle and then I end up at Woodwards...When you see those SUVs lined up on a school day at both schools, you know that it's just gone wild, cars gone wild. The community, is that really healthy for their children?*



Figure 5: "Smart LEGO" session: Roland's neighbourhood model

Later, Roland elaborates on what experiences inform some of his design decisions (reflecting on how elaborate Karen's and April's models are compared to his):

Roland: *Well for me, I didn't put in the details, because I'm really bad at Lego, and also what I'm really looking for is...*

April: *A connectivity?*

Roland: *No, I'm looking for something to take a picture of, while I'm bicycling, and it's not usually a person because it's more likely a car. Cars look good when they flash by me. Or, it's another bicyclist. What else was transient? Or it's an unusual poster. There's a lot unusual posters posted along Union and Woodland.... Yeah, so when you stop for a traffic light or a stop sign, you see the posters, I think, usually.*

Facilitator: *Why do you take pictures of them?*

Roland: *Because they're there. I guess they're always changing, right? People...it's a dynamic thing, that's why I like taking pictures of cars. I'm not a fan of watching them zoom by. Still I thin, what are these people thinking as they zoom by every day? As they run the red light, the other thing is I could've put the buses right above Woodland and Main, Woodland and Broadway, Woodland and 12th, as they as they break traffic rules.*

So the positioning of one's self as a neighborhood documentarian alters his experience of and relationship to his neighborhood, as one might expect. His attention turns to objects at points where it is convenient to stop (structured by the city's traffic light layout), as well as objects that are in flux (posters for events). Roland reflects that his model would have looked very different if he did not move around this way, constantly photographing everything. Thus, the presence of a camera, and our use of it in documenting the space around us while we inhabit that space, can have a shaping influence on the way we perceive and remember our being in that space. Photography exposes more informational layers to a city, allowing us to reflect back on our experiences and examine them for details that perhaps otherwise go unnoticed. Though it might seem obvious, the point is still significant: the use of mobile cameraphones can potentially enhance our locational literacy, by introducing additional layers of information about locations. The presence of a camera also affects the interpersonal dynamics that

take place in urban settings, suggesting that locational literacy is also connected to interpersonal dynamics.²¹

This prompts a lively discussion about pedestrian safety and rates of accidents caused by cyclists versus accidents caused by buses and cars. Karen notes that two intersections in particular are the worst for pedestrian fatalities:

April: *There's so much pedestrians and they don't see, and they're in various states of sobriety so they walk and then I've seen people actually gun the motor and they just...I've seen some really weird, bad stuff.*

Karen: *I'm really fascinated by it, because there's actually I think a very important interaction between the image of the downtown East Side that people get and how they treat it as a place to drive through, being that it is such a major artery.*

[crosstalk]

George: *Are you thinking that people actually will drive faster through downtown East Side, and pay less attention to pedestrians at that place?*

April: *Oh, yeah.*

George: *Could that be out of nervousness?*

April: *Or anxiety or general distaste.*

Karen then explains the contrasting example of American cities, where the Interstate freeway system was built to take regional traffic out of residential neighborhoods:

Karen: *From a transportation perspective, one of the craziest things about Vancouver is the fact that we don't have freeways. What we have instead of freeways is that we have streets like Hastings... What happens is that much of the traffic, so if you think about the way traffic flows in all the streets. Some of the people who are driving on Hastings Street, their ultimate destination is downtown. Other people, their ultimate destination is somewhere like north town*

21 But as this notion is more closely connected to the theme of the political dimension of locational literacy, I defer further discussion of it to a later section of this Chapter.

or West Van, right? What you find is interesting in the States is when places have freeways, they take all of the regional traffic off the small roads. When I was in Portland, I was really surprised by how little traffic, some of the local roads had. Then I realized that you won't get something like... You won't get a 12th Avenue in Portland because, 12th Avenue only exists because we have no freeways. But what's interesting is that, all of the places that come from freeways, places underneath freeways. So we could imagine that if there were freeways, they did actually, the diversional plan back in 70s was to build a giant freeway that would ring around through downtown and go through Chinatown. So the plan was to put the freeway exactly where (the viaduct) is now, pretty much.

This segues into a short discussion about the history of a pedestrian overpass in Strathcona, which leads to more discussion of the history of planning in Vancouver:

Facilitator: *it's a pedestrian overpass that goes over the railway. It was actually a group of mothers who were lobbying government...to put that pedestrian overpass in, and they actually laid down physically on the tracks, I believe in the late 60s....They protested against the company because people were dying because of this unsafe crossing.*

Karen: *I mean, that whole political situation around this issue, it's been one of those really...It's a quite funny thing to bring into this conversation, because the original plan for False Creek Flats was back in 1999. It happened during the dotcom boom....They actually dezoned it as an industrial, in order to try and pretty much roll out the red carpet for tech firms to add buildings there. The bubble burst not long after they made that decision.*

Roland: *They designated two sites. That site and also Burnaby, which is now a liquor store.*

Karen: *Yeah. The Burnaby Tech Center at Broadway... But it is really interesting to see that all of...Jane Jacobs has this whole idea that new ideas, need old buildings, right? The fact that all the tech startups are out...*

Roland: *If you look at South Park, San Francisco, you can look at Portland. If you look at all places where start-ups are, the buildings look almost identical to all the ones we have in Gastown. High ceiling, brick and if you look... You'll see all of them are not wheelchair accessible.*

Karen: *They were all buildings that were built around the same time.*

Roland: *I know. It's hilarious though, isn't it?*

George: *(with sarcasm) Before women and disabled had jobs. (laughter)*

These latter snippets of discussion point to the ways transportation infrastructure (as well as the presence of a camera in the hands of a citizen) can have a shaping effect upon the experience of location by urban residents, and how this informs participants' sense of locational literacy. For one, awareness about the history of urban planning (a historical informational layer that augments participants' perceptual depth in terms of locational literacy) in a city (for instance, historical explanations for why Vancouver has no freeways) can potentially empower urban residents in their understandings of location. This improved understanding may be of utility in engaging in more meaningful discourse about location within communities, and between urban residents, urban planners, and civic officials. Already, participants have articulated how perceptual matters matter, that locational knowledge is empowering, and that becoming locationally literate requires a degree of localized knowledge (in this instance, community urban planning history).

Scott, who has been a resident of (and cyclist within) downtown Vancouver for several decades, has much to add to this discussion of how infrastructural elements play a part in our perceptions of place (and hence, our locational literacy). Both his auto-documentary and contributions to group discussions provide some further insights on these matters.

In his auto-documentary (a digitally annotated map, with extensive written notation), Scott documents his daily commute. He takes somewhat unusual turns through industrial sections of the East side of Vancouver (Figure 6). Several pathways along this commute consist of roundabout shortcuts and urban hacks (ramps, pedestrian walkways, railway yards, port roads, a tunnel under the downtown waterfront area, and

other “unofficial” commuting routes. Scott’s commute is much like his approach to technology – self-styled, independent, and efficient. There is little sense that the commute has a political dimension for him, however. More of this comes out in Scott’s contributions to group discussions:

***Scott:** My documentary details my favourite route for connecting to the seawall (and onwards to Stanley Park) from the DTES²². I begin at the intersection of Main St. and Alexander, just before Main Street turns into an overpass over the train tracks. From here I loop through Crab Park, across the large parking lot on the West side of the park, along Port Road, past the Seabus station, and then through the underpass past Canada Place, the Convention Centre and finally navigate the tortuous maze that comprises the current connection through the seaplane base at the Northern End of Howe St.... As expected I lost GPS connection while in the underpass which is why my map has a large gap until I emerge on the other side - the route between my last known good reading and where it picks up again is relatively direct. Obviously this also affected the geocoding of my photographs, although instead of showing no geodata, Android chooses to geocode them with the last known good location.*

Scott, who is clearly knowledgeable about how to use geolocational tracking technologies consciously, is concerned with how the recording of his movements in space is not accurate, as this reflects upon how some parts of the city are legible (from a top down perspective), while others are rendered invisible to this perspective.

While Scott may not perceive this as a political problem, it may yet be – the rendering of some parts of our everyday urban experience (such as how certain commuting routes are possible, enacted, and recorded via GPS devices) as invisible to the logic of planning and administration can imply that these possibilities of tactical experience in the urban environment will be overlooked by policymakers when decisions affecting infrastructure are subsequently made. The possibilities of the city can be erased or enhanced by the awareness of location based information that may be emphasized (or alternatively, ignored) by the locational interfaces we make use of.

22 DTES is an abbreviation for Vancouver’s Downtown East Side, a historic inner city neighbourhood that has a notoriously high level of homelessness, poverty. At the time of writing, the DTES was undergoing an extensive process of urban gentrification.

Fortunately, individuals with a high degree of technical literacy (like Scott) are keen to point out these discrepancies, which can potentially prevent these kinds of scenarios from happening. Thus, technical know-how may be seen as a component of locational literacy, at least in terms of coming to grips with how locative interfaces can be optimally engaged for projects that benefit communities in line with their cultural prerogatives (in this example, ensuring that cycling routes that are otherwise “invisible” to planning discourse can be made visible).

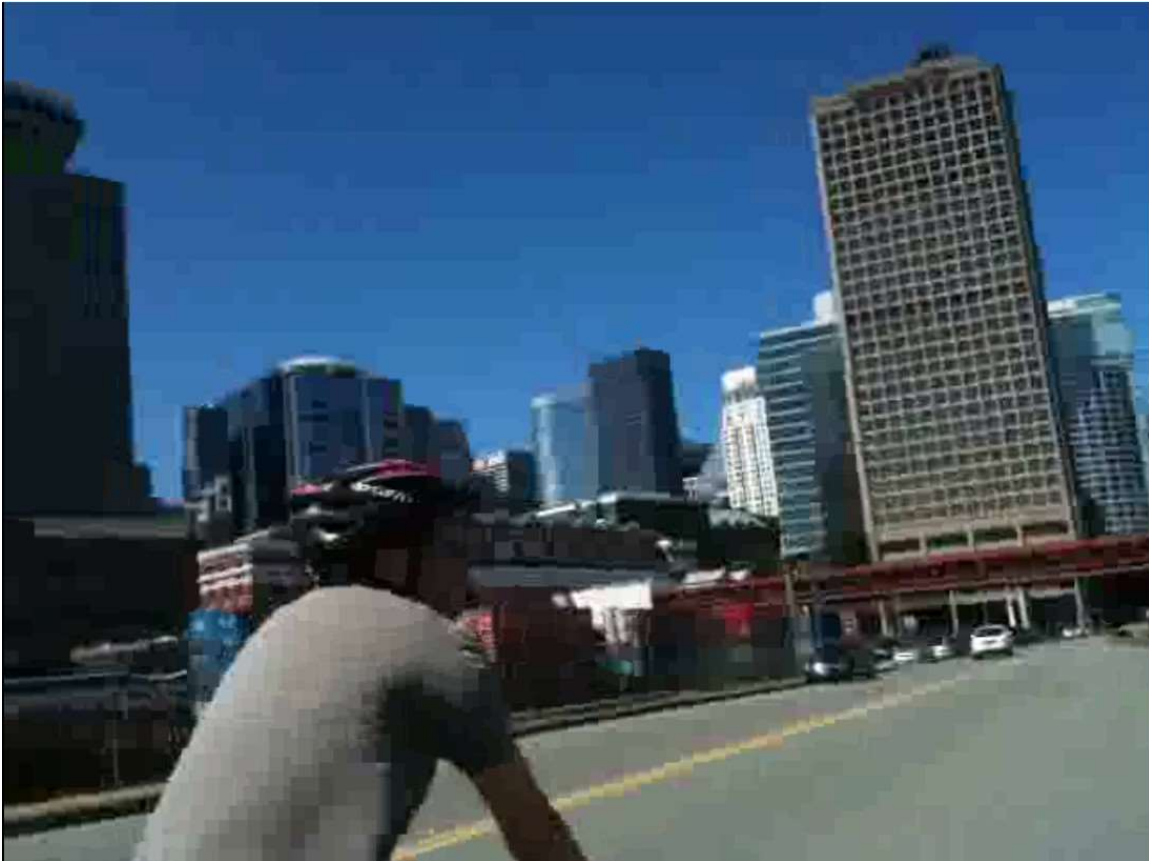


Figure 6: Scott shows the ethnographer how to commute by bicycle on the fringes of, and under, the city of Vancouver

April, who lives in the DTES neighborhood that Scott commutes under, traverses some of the same ground that Scott does (the DTES), but does so with attention to a completely different set of details: the largely human community members who are continual pedestrians, homeless people and street trading people along Hastings Street.

April describes her model (Figure 7) next. She has put a large number of human figurines in her model, because, as she explains,

April: The DTES is one of the oldest neighborhoods in Vancouver. We have a lot of pedestrians, so a lot of us walk around. A lot of us also take the bus, but because it's a small, tight-knit, neighborhood of about 10 blocks in radius, we walk a lot. So this (indicating the figurines) represents all of the pedestrians, the street people and all the people doing their happy street activities and...this (indicating buildings)...represents the ramshackle, retros hotels that are slowly being gentrified to make way for beautiful new condos. I live at Woodward's, so my commute in a usual day will be walking.



Figure 7: "Smart LEGO" session: April's neighbourhood model

April indicates that the neighborhood is like a "living room" for many of its residents who do not have homes. However, the neighborhood is bisected by Hastings Street, as she describes, which conveys a completely separate group of commuting individuals through her neighborhood on a daily basis:

April: *Hastings Street is also a major through way for trucks and buses and cars, and such and such. Recently we completed an eight month study of the pedestrian safety project in the downtown East Side where they were pushing for lower speed limits, from what is currently up to 30 k. We didn't get that, but we have more traffic lights and we have longer times when we cross, the crosswalk.*

Karen: *The countdown lights.*

April: *The countdown, that's it. My usual life is either walking or taking a bus, and a lot of my friends who live in the area do that, also. There's about 20,000 people that live in the downtown East Side, half of them which are considered homeless²³, they're living in substandard housing, they're couch surfing, they're on the street, they're in the shelters. There's a whole mix of people. There's a lot of care workers, there's a lot of retirees.*

April also explains how another group of pedestrians make their way through the DTES on a regular basis – spectators. From photographers (amateur and professional), to student filmmakers, to journalists, to tourists (individually or in organized tour groups), a distinctive transient pedestrian population occupies space in the DTES, with distinctive informational layers at its disposal, and that puts distinctive informational demands upon the location and its more permanent inhabitants.

While April's daily interactions center predominantly around the homeless, addicted, and street-trading residents in the neighbourhood, her observations and perceptions about the neighbourhood are more comprehensive in that she is able to maintain a “big picture” view of how other groups of occupants (cars, buses, cyclists, and pedestrian spectators) make use of the neighbourhood using distinctive informational layers. This has consequences, as she points out. While traffic lights and crosswalks are often ignored by the homeless, addicted, and street-trading population, these infrastructural elements are essential survival data points for drivers. This can lead to unpredictable traffic conditions, hazardous conditions for pedestrians and cyclists of all sorts, and injury or death for some.

23 In 2011, the official homeless count for the entire City of Vancouver was 1800. In 2017, that number is now over 2000.

Nonetheless, the co-existence of individuals and groups who are operating on different informational layers in the same physical space is noteworthy in terms of how this translates into the legibility of these informational layers at the level of civic politics and planning. Is a neighbourhood like the DTES being planned for its permanent residents, for the more lucrative groups (in terms of revenue coming into the city) tourist visitors, or for traffic management purposes? How might traffic management prerogatives work at odds with the nature of everyday action within a community, itself mediated by the myriad ways residents are observant about their locations? April points to at least one instance where these differences have been made legible within the planning discourse – the implementation of reduced speed zones in pedestrian-heavy sections of the neighbourhood (i.e., on Hastings Street), implemented in 2011. These alterations to the infrastructural planning demonstrate a sensitivity on the part of local planners to the varieties of locational perceptions that are in play in the DTES. In this sense, one can observe vernacular narratives of place becoming incorporated into administrative, strategic planning discourse.

Karen (who was, at the time of this research, an urban planning student), in describing her neighbourhood model, expresses a keen understanding of the relationship of vernacular and official discourses of place. Her model has been designed with an emphasis on capturing the features of interest to urban planners – density of housing and residents, use types and zones, census tract data, and the like:

Karen: *This is for the park, which is under renovation right now.*

Facilitator: *Which park? The one close to your house?*

Karen: *It's the former Mount Pleasant Community Center. They're rehabilitating that site, so it's pretty much been fenced off and gross for the last two years. This sign represents the fact that there's a school. I live really close to it, my neighborhood is predominantly a single family home neighborhood....What happens is, because these houses are really old, they tend to have be divided into five or six suites. That neighborhood is also ground zero for infill housing, which I'm representing with people living here. Infill housing is the predecessor to laneway houses. You get people living above garages and I sort of have a little dream that maybe one day, that's where I'll be living instead of.....like extremely*

bright happy faces. It has its downsides. I can hear my neighbors when they talk in their bedroom and they can probably hear me talking in ours. But our neighborhood is kind of cute, because we...The census information says that, I think, 70 percent of my neighborhood rents. So, most of the people who live here don't own it and are living in these kind of houses...To me it's interesting, because it's a form of density that we don't associate with it and when they're walking through the neighborhood, you don't...

George: *Renting is not associated with density? Oh, basement suites.*

Karen: *Yeah, because it's all divided into basement suites. They're all really large, historic houses. When people build new houses in the neighborhood, they tend to capture and conform with the character, but they also do multi-suites. There are very few houses where you can tell only one family where you lives.*

Karen then describes her commute (which is usually on a bicycle), as well as her acute sense of attachment to places - especially buildings that were once home to businesses that have since been replaced by new businesses²⁴. Further into the discussion, the group picks up the thread of how transportation modality impacts perception of the urban environment. This segues into a discussion of the politics of urban space (more discussion in the Politics section below). There is some intriguing talk about getting around in various modes of transport in the city, and the sense of what's a morally correct way of doing things. For instance:

Roland: *Every day I see bus drivers running red lights, I see car drivers running red lights. Yet no one ever mentions A, how it's bad for the environment, B, you're breaking laws. Everyone focuses on cyclists breaking laws and doing silly things. If you try to follow the rules, as a motorist, as a pedestrian and as a bicyclist, you would find it extremely difficult. You would notice that if you started monitoring who is following the rules and who isn't. By far the motorists are breaking the rules.*

Karen: *It's fundamental attribution. If you break the rules, or if you do something, you're fully justified because you have access to all the full information about everything that you know about yourself in this situation. When*

24 I take this latter set of Karen's observations up in the next section, on Memory.

you look at what other people do, if they're doing the same thing, they must be doing so because of some kind of a personality flow.

Roland: *I feel like I'm walking through the city, and seeing a different world than people in cars. They're totally not experiencing the city in the way that I do [laughs]. I think it's partly fundamental attribution here but it's also a culture, a social culture thing. The motorists have a culture. When I drive I'm not really part of that culture. I drive the speed limit because I'm too afraid to go over and then I'm a bit crazy about it. Is it too under, too over...?*

The group acknowledges that there is an inherent alienation involved in cocooning one's self in a private car. They discuss some of the implications of this:

Karen: *It drives me crazy when I drive too because I'm back into this culture that I've been indoctrinated in over a long time ago, but like little things, like how I'm used to having full 360 degree vision on my bike. I don't have it on the car and the awareness, not that I am the enemy, but I feel I'm a bit of an enlightened enemy. I'm still in that camping map. If I am a little slow on my reflexes or if I'm careless, I do feel that full weight of that responsibility in a way that I don't have when I'm on the bike. Which I don't think that people internalize quite as other drivers.*

Scott: *The other thing I think is that you're as vulnerable in a car as you are on the bicycle, you don't realize it...*

Karen: *Or you know when they talk about how they design SUVs in order to make people feel comfortable. You're actually actively discouraged from acknowledging that the fact that you're dangerous and the fact that you're in danger.*

Roland: *I find that interesting that we fill our cars with media too, a little DVD players to keep the kids preoccupied at the back, we put our GPS things in which...Watching that GPS thing, when getting directions from it which are usually wrong. It's a real distraction. Then, talking on the phones which is thankfully it's been acknowledged.*

George: *Even AM/FM radio can be distracting, you sing along to the tune or you're changing stations and you don't...*

Intriguingly, media (including mobile phones) are part of the assemblage of technologies and objects that make up this “cocooning”, individuating experience of being in a car, which then has the effect of limiting the perceptions of the driver to information that is only functionally relevant to operating the car. In this sense, locative media, deployed according to logics of consumption, efficiency and speed (the logics behind driving a car versus using other modes of transportation) can play a role in diminishing a person’s locational literacy. This critique is extended to the conditions of bus drivers as well:

George: *When I take the bus, I feel like "Oh my gosh, this irresponsible bus driver goes through too many red lights. I'm in big trouble here." I try to stand at the back now. I figure, the number of times I've seen buses run red lights and the number of times I've been on buses running red lights, especially that 99 to UBC? I try to stand at the back now because I figured that it's safer.*

Roland:...*By honking at least.*

Scott: *I heard about problems with safety -- you might know more about this -- I've heard third hand from people who live in the Downtown East Side, sometimes people lose limbs from buses.*

So the experience of operating a mechanized form of transportation is a heavily mediated and mediating experience, with severe implications for how individuals can sense their environments. As I will discuss in the section on Politics, below, there are also implications in automobile use for how individuals are inscribed within environments.

In summary, participants created LEGO models and auto-documentaries that highlighted the features, objects, and people in their communities (or along their commutes through their community) that are most informationally relevant to them. In so doing, they identify a layer of information that corresponds to their immediate perceptual world in the city. In being exposed to other participants’ models, notable differences emerge with respect to what kinds of layers of information are noticed, the impact of

using a picture- or video-taking device in public urban space, and the involvement of other human beings in defining the relevance or visibility of objects and features in public spaces. Spaces can be occupied by different user groups with entirely different – and often conflicting – visions of what that space means, or what it is to be used for. Infrastructures can be designed to make certain uses invisible while others are visible. Further, modality of transportation affects what people, objects or features are visible or legible in the environment – with cycling or pedestrian modes highlighting very human-scale details (and automobiles and buses de-emphasizing these details), and with public transportation highlighting the presence of other individuals' prerogatives as a relevant part of the social and technical landscape (this is the genesis of the micropolitical dimensions of urban space, discussed below). Participants also note how the presence of a media recording device affects the behaviour of other people in the environment, which contributes to an environment that produces different perceptions. They also note how perceptions are shaped by familial and institutional relationships that an observer has in their community (with home, work, friendship, and family spheres, among others, directly impacting and affecting the account of what is “visible” and invisible” in their environments).

4.4. Memory in the Mediation of Individuals' Relationships with Locations

Discussion of how memory is implicated in our reconstructions of the city neighborhoods we live in was lively at the conclusion of the Lego session, and this theme is picked up in several of the group's later conversations, as well as in their auto-documentaries. This becomes a dominant theme throughout the ethnography, and points to some specific implications for locational literacy as I have defined it. The memory-assistive functionality of modern smartphones is highly valued as seen in how some participants engage with practices of photodocumentation, trip tracking, and email archiving. Members of the group also acknowledge how memory and digital archiving bring with them social expectations and boundaries, centering around “what is appropriate to archive” and “what is a reasonable/appropriate amount of information to retain about other people” in everyday interactions with them. Memory is also tied strongly to place associations, which has strong implications for participants' practices related to documentation. This is in part due to strong sensitivities relating to data privacy.

The LEGO session wraps with a consideration of a few questions about how the exercise inspires us to think about the past or about the future of the city:

Facilitator: *How much of this exercise though, our entire exercise, do you see as an envisioning of a future, or an envisioning of bringing something back from the past?*

Scott: *I think it's bringing something back from the past. I think we have the pathways. We have the out cow paths for bicycling, for walking, for non-cars. It's already a part of the city. East Van, where I live, downtown East Side, and your neighborhood especially have all those ways to do it. We just have...*

Karen: *What about what you were saying about using the old railroad?*

Roland: *De-emphasized them. They're all there. We just de-emphasize them. I don't know about Lougheed, though.*

Karen: *I never see it. It's all buses and burbs.*

Scott: *It's all purpose-filled post 60s. Is that true?*

George: *It's terrifying.[laughter]*

Roland: *Have you taken it?*

George: *No, I haven't taken it. I fear for people's lives on it.*

Karen: *I actually have taken it. I used to live at Cariboo Hill, so I used to take the bus to Lougheed, and then take the train into town all the time. The speed of the traffic on Lougheed Highway, even though there is a dedicated cycling lane pretty much the whole way there makes it, 1, really dangerous, but 2 is that fact that Lougheed as a landscape is really boring to ride through. It's the equivalent of riding your bike in the ditch.*

Facilitator: *There are no hidden side streets that you can take?*

Karen: *I would say that, Burnaby's major cycling success is probably the Central Valley Greenway route, because A, that one connects to the Vancouver route,*

and B, it actually is off Hastings. Burnaby does have some topographical challenges, but it also does have a decent network of walking and cycling routes, around the north part of Burnaby. South part Burnaby, you have the route that goes underneath the station, and you're pretty much limited to those as really well-developed routes.

Roland: *That's not to say that we couldn't learn lessons from the infrastructure that's in Vancouver's neighborhoods. Graph them back on to, a Lougheed-type neighborhood.*

The group then embarked upon further discussion about carrying children around as part of one's commute (mainly anecdotes shared by the Facilitator as prompts, which lead to more discussion of the psychological dimensions of transportation):

Karen: *Transportation planners, we talk about the psychology of transit. When I was in Montreal, I heard much the same thing. It's part of the reason the cycling culture is so intense in Montreal is because people hate the transit there.: The transfer penalty is one of those things we study in psychology because that obviously means you have to understand how frequent the first bus you're going to take is and how frequent the second bus you're going to take...There comes a point to where it's really about the trade-offs when it comes to time, effort, ease, easy to understand, easy to navigate the system...What I noticed when I started cycling, when we talk about network planning especially in a grid system like Vancouver, if you're traveling from one place to another on a Cartesian grid, you have linear lines. What that almost means is that everywhere you go, you have to have at least one transfer.*

Roland: *Transfers are bad. Of whether or not they are going to wait, or whether or not you're going to have to wait through an entire cycle because you just missed the bus. Whereas in some cases, a bike will be faster than that...Other than flat tires, you're master of your own destiny unless you live in this Lougheed craziness where you don't want to share the road with others or with speeding cars.*

[laughter]

Karen: *The autonomy that's associated with a bike is really what's key. That's when biking becomes competitive with transit. What you have in those kinds of cases is that transit is only competitive with bikes for certain destinations and not others. It's optimized for a certain travel pattern. When you actually think of the travel pattern that's required in order to meet your daily needs, unless you live right next to Lougheed, and then even if you have certain aesthetic preferences around the actual walking spaces on Lougheed, you still might decide that it's too grossed up to deal with, right?...It's interesting to think that the root of sustainability is how much energy do you have to expend in order to meet your daily needs and do the things that you want to do, and how much freedom or autonomy do you have within that matrix of choices. Do those choices necessitate the burning of fossil fuels?*

Participants then broke, and were asked to create logs of their media use over the next two week period. These logs were submitted via the group wiki, and reviewed by the researcher before holding a debriefing meeting. IT was at this meeting where the theme of memory as it interacts with our experience of urban space came up.

About 17 minutes into the media log review meeting, they finally begin to discuss their media logs. There was some confusion about how to report television watching – whether it matters that it happens via a mobile wireless device or through a home based box. Roland was embarrassed to report Twittering, so forgot to include it. Others lumped in their social media accounts (Google+, Reddit, Facebook) as one type of activity, while others left social media reporting out entirely.

The group reported trouble consistently remembering everything they did, and some (Roland) noted that they needed to go back and revise their reports. This inspires him to think aloud:

Roland: *It would be better if we had software that tracks what we're doing in our mobile phones, I willingly submit my data. If we had something collected on Blackberry, iPhone, Android, that would do it.*

Then there is a bit of tech-talk concerning how to pull location data from text messages, media watching, and other activities on a Blackberry vs iPhone vs Android phone. In response to a question about when we ever put down our devices:

Roland: *I'm using devices except when I'm sleeping.*

They were further probed about how they documented their media habits. Did they carry the logs around during the day, updating them periodically, or did they do it all in one go at the end of the day. If so, how did they remember things?

Karen: *Yeah, it was interesting to think about. We are the ones, and when I was doing...It would be interesting to see what I recollected versus what actually happened. Where the discrepancy is, because you can think of a day in terms of what they call activity based idea.... If I remember if it's location-based, that is do I remember moving from one place to another... Do I remember? Was I using any media either during that time or when I wasn't there or when I was there? It's interesting how that mapped onto the social interactions would which I also use in order to understand locative messaging.*

Some participants shared their thoughts on recollecting actions by looking at receipts, as well as photographs:

Roland: *I did that all the time. They could look at Flickr to see when something happened...There was a couple of times I'd look through and do that although I was carrying it with me. I would get a text, I would mark it down....*

Karen: *I think for things that are something like an address that that might distort this information... not being able to have access to that would be like me wiping my IM records every other day, or wiping my text message history at the end of the day. It seems like completely baffling to me. I make a point of keeping information. If I'm negotiating with someone like when I'm going to meet them, or where I'm going to meet them. Sometimes, not very often, I'll be able to actually successfully mine that information in a calendar...I like the fact that when reading my text messages, it pops up wherever I want to send the message in my iPhone. It's like "what did I last say to this person?", "when was I last in touch with them?". Even if I've been in touch with them in some other way since, it's a nice re-contextualizing.*

Facilitator: *You mean you need to know... "Before I talk to this person about this topic, what do they already know?"*

Karen: *Yeah, “what was the last thing you said to them?”*

George: *Did I tell them, I had to go through an email sometime, like go back several weeks. Seeing what that person's perspective was.*

Clearly, the augmented memory offered by mobile handset computing is strongly valued for a few practical purposes – picking up threads with social contacts where they were left off last. This is something we struggle with when we don't have this assistive technology at hand.

April: *I think people who have a healthy sense of not wanting to waste minutes versus talk do that. [laughter]*

Karen: *I wouldn't want somebody to email me and be completely baffled by the entire history of our conversation when there's a social expectation that that's available.*

George: *That's your approach?*

April: *I don't.*

Roland: *I look at people's Twitters if I haven't talked for a while, and see what they have been tweeting about recently.*

Partly, then, this is a socialized experience, as Karen points out. Societal expectations partly drive our impulse to rely on the assistive memory functions of handsets.

Further, one of the participants provided a meditation on how social media technologies can muddle the context of our interactions via their streamlining of services, highlighting in some ways the notion of the “inscribed” dimension of the “sensory inscribed” interfaces we make use of:

Roland: *It's interesting having the different context, having different messages because it was a couple of days ago, that Facebook recently merged the chat with the messages. Have you noticed that? Going to the history, it's so hard for me to distinguish what was important enough that I had to send somebody a message versus asking somebody what they were doing that evening. It's all kind of conglomerated together... I think that was a bad idea, because I think*

people expect to be able to find things based on context. "That was a chat with George", or "that was an email exchanged with George". We have different expectations and they're pushed in together like that. It's not good.

Karen: *I've seen people who specialize in thinking about online collaboration, who say the different media that you have whether it's email or phone call or IM or whatever else, you prioritize based on that and the one that you choose says something about, as you say, the urgency or the importance. You use that as that system to help you to make sense of that. It's interesting that apparently Facebook didn't think that was important.*

The group then chatted about the expectation of permanency with email vs other person-to-person media (instant messages, texts), which are generally accepted to be more "ethereal" and impermanent. On this subject, Karen related a story about a former partner who archived everything, and shared old texts from ex-girlfriends with her, which she found horrific, and testament to our expectations around these media. Roland agrees, and doesn't think email should be used a database:

Roland: *To me, the email archives is nice to have when I must, because it's like having clothes. You haven't worn the clothes in six months, and you're not using it for special occasions that periodically repeat, like weddings and funerals, then throw it out, man. That's the way I feel about email. Email is not a database. If you have email that goes back to 2004, fine. It's basically dead to everyone except you. If you really want to get value from the archive, you should blog or Wiki about it publicly, or in small groups, or whatever. It's useless, for one person.*

Karen contrasts this *ad hoc* personal policy with that used in government work:

Karen: *Whereas, in the government context, you actually are really careful about what you keep and what you hold onto, and even what you say, because that has been, in the recent past, used as a weapon against employees at times... People have become to the point where there's accusations of people entering meetings and saying, "There's absolutely no meeting minutes being taken. You're leaving everything with it in your head, because you don't want a paper trail."*

Scott: *That's almost illegal in government, isn't it, not to have a paper trail?*

Karen: *They've gotten away with it. [chuckles]"*

In a related vein, Roland articulates a vision of social media platforms idealized as remix commons, especially open platforms like Flickr. Technical limitations on Instagram, he notes, don't allow for this kind of participation. Karen mentions how highly curated representations of urban patterns (e.g., stop motion animations) are the opposite of Roland's "upload it, geotag it, leave it in the database for later remix" approach. The group discusses this further:

George: *Don't you find the phrase "Pics or it didn't happen" very curious?*

[laughter]

Roland: *In 2004 when I started taking picture of everything and posting them immediately to Flickr, people thought I was crazy. Now, it is so common that people say, "Pics or it didn't happen." "OK, you thought that I was crazy, 2014, you are taking pictures of my food and everything else."*

April: *Now I have friends in my Facebook wall say "Oh, I just noticed that pretty much everything I say on Facebook is either what I am eating or who I am eating out with".*

The group also discusses how existing regimes of geolocational data are limited in terms of how they might contribute to sense of augmented public consciousness, or augmented public memory:

Scott: *The early geolocative data that's out there...It's getting progressively better and better. Right?*

Roland: *They're all silos. They're not connected. The check-ins are not connected to, the Flickr photos are not connected to...*

Facilitator: *Have you seen those visualizations of iPhones that look like fireflies?*

Scott: *Sure, there's a whole bunch of things out there like that, but that are not connected, and there's some reason why they couldn't be connected in my opinion as a technology expert. They should be connected because it would make it richer.*

Karen's self-documented commute, as well as her LEGO model, are almost entirely concerned with memory as it relates to the legibility of place in the city. What follows is a recapitulation of her auto-documentary (a narrated, bike mounted video of her commute home from downtown Vancouver).

Her video begins on a busy downtown street on a clear, sunny summer day. Karen notes at the outset that her travel is not so much a commute but a series of stops. Being on a bicycle enables a resident to do this with less trouble than a motorist:

Karen: *not so much a commute as it is a stopover...because my commute often involves stops along the way to pick up things, which is one of the very nice things about being on a bike, being able to perform multiple tasks on the way and not having to deal too much, at least on days when I'm not carrying too much stuff on my bike that I have to subsequently carry on my person.*

She rides from Harbour Centre along Hastings. She reports that she has been attending school at Harbour Centre since 2003. She talks about how commuting is easy to the Cambie area around City Hall. The proximity of her home location to downtown makes her feel more safe and confident about commuting by bike. She reports that she has been cycling since around 2005. During this time she has witnessed the development of the Carrall Street greenway (a set of separated bike lanes) and implementation of 30 km per hour speed zones in the DTES. She reports that cars still are not going much slower than they used to, but that there's a "subtle difference" in traffic since the new rules went into place. She rides past some staggering DTES residents and the sound of bottles dropping. "Bike lanes are constantly a site of negotiation", she adds, noting the presence of a few trucks using the lanes to park and unload. She reflects on the processes involved in the implementation of this greenway:

Karen: *I've met people who've helped work on the public consultation for the Carrall Street greenway and there was fear that it would become a bike superhighway where people would just pass by, but I don't think...I think the*

engagement that comes with being on a bicycle as opposed to being encaged in steel when you're passing through changes it a little bit. There's certainly people who are still trying to stream through...but there's definitely a level of engagement on a bike that you don't get.

She pulls into the T & T supermarket's cul-de-sac and roundabout just off Keefer. Notably, this is the site of a Mobi bike share stall now. She complains that she cannot find bike parking here. She starts to muse about Copenhagen and the conflicts there between pedestrians and cyclists over things like bike parking – whether or not there will be technological solutions for that sort of thing. She notes that bike parking affects one's navigation and choices about where to go in the city.

She proceeds to ride on the False Creek seawall bike route. The seawall doesn't have a lot of bike parking, as she notes. Here, she relates a memory of Expo 86 - "waiting to get into Ontario House" on what is now land owned by property development corporation Concord Pacific²⁵. She mentions the ongoing construction in the area, and how that keeps things changing in terms of the kinds of interactions she has with pedestrians. She opts to ride off the bike path due to the construction, and instead rides through a parking lot. She says that this is an important part of our contemporary anxiety about urban life – the unpredictability of change brings with it a constant set of choices and decisions: "Choice or flexibility comes at a price", she says, as if to underline this point. She talks about Seattle, which has different urban conditions, under which people make decisions differently. She rides past the Olympic village. She talks about it as an ever-changing project, with similar traffic uncertainties for cyclists (Figure 8).

25 Concord Pacific has been one of the leading development companies in building high rise, luxury condominiums in Vancouver False Creek, Yaletown, and DTES neighbourhoods. Their developments have left an indelible mark on Vancouver's skyline, as well as the city's property market boom.



Figure 8: Karen commutes through a "cyclists dismount" zone in an ever-changing landscape for low carbon commuters in Vancouver

Moving through the Brewery Creek area, Karen notes the abundance of car based infrastructure vestiges located here. Development pressures to at once keep this industrial but also expand the residential sock in this area. She refers to her next obstacle in reaching home - the hill on Ontario Street between 2nd Avenue and Broadway as “an embodied experience of sustainability right here”, explaining that how well she does going up the hill is a measure of her sense of physical fitness. She adds that Ontario Street paradoxically feels more safe because of the higher volume of car traffic on it, noting, however, that her memory of this street is coloured by her experience of being injured after falling off her bicycle on it once. She proceeds southward through the intersection, then continues up to 12th Avenue. She notes that there’s always something interesting at Ontario and between 11th and 12th, involving scribbled graffiti messages left for different people left in public – a kind of ritualized vernacular repurposing of that corner (or what Lefebvre might call an instance of “spaces of representation”).

As she continues on into her home neighborhood, she relates how she recalls places due to various things she’s witnessed happening there – from civic conflicts over

development issues between citizens and the City/developers, among other events - “Even memories of seeing couples having sex along that chain link fence”. She thinks that there is something different about experiencing the neighborhood from a bicycle, as compared to experiencing it as a pedestrian or in a car.

Also noteworthy with respect to the implications of memory and being “inscribed” in space is how participants approach the privacy controls on the locative media (video, online mapping tools, and photography, predominantly) they have been using in this research to document their movements. While Karen’s auto-documentary is a private Youtube video (at the “only users with the link can see it” level of privacy), April’s videos are all highly public, as are Roland’s images and videos. The Runkeeper data provided by Karen is also private. It is also noteworthy, as Karen points out, that Karen adapts her routes in Runkeeper by shutting down before she’s within range of her actual residence - another privacy tactic.

Roland’s (and the group’s) reflections on his solo documentary are also illuminating on the theme of memory and placemaking. Roland has much to say about another kind of “mental augmentation” - that is, using photography and related apps as digital photo albums of sorts. Karen has some reflections on this practice here, too:

Scott: *With things like Facebook to timeline. It seems People are ready to accept that kind of things.*

Facilitator: *What prevents us from accepting those kinds of things?*

Roland: *It can be overwhelming.*

April: *The memories...I think it's the idea that it's something cold about it. A daily reminder of the year is very cold in terms of...*

Karen: *The memory or something cold about it, right? A daily reminder on a year is very cold it terms of the role. It's a UNIX time stamp is being prepared one to the other. I think the Idea of serendipity or the kismet is that there is something mystical about it... It would be interesting to put it in kind of...If it were to be a true augmented serendipity, it can't be too obvious or quiet. It tells you what it tells you. At its very root it starts off with a random number or something, and then it's pulling in a whole bunch of different things from...*

Roland: *Weather.*

Karen: *The weather, time via, maybe what time the sun is going down today*

April: *What you had to eat.*

Roland: *Current events.*

This reinforces some of the commentary from Karen with respect to her LEGO model of her neighbourhood, created several weeks earlier. In that context, Karen discussed her acute sense of attachment to places, especially buildings that were once home to businesses that have since been replaced by new businesses. She further relates how memories figure prominently in her mental representations of the spaces she inhabits:

Karen: *This (indicating a row of buildings) represents the businesses along Cambie Street, and I put blue box on there because some of the new recycling boxes that are sitting around there, and this also kind of sort of represents Main Street - which I really find that I have a hard time, and I've been using my neighborhood, because I really value being in between Cambie and Main Street, because I grew up along Main Street, further south along here, actually. I just love the diversity of Main Street. I recognize so many of the restaurants, which are nice. I go there probably about as much as I go to Cambie Street.*

Facilitator: *Are some of those restaurants that you grew up around Main Street still there?*

Karen: *Yeah, some of them, like the Mui Garden is still there.*

Facilitator: *That's been there for 20 years?*

Karen: *Well, it hasn't been there for 20 years, but it's been there for at least 10 or 12. Because we used to go there when we lived in East End. Even if the businesses aren't the same, I still recognize the buildings....One of the only places where I can think of that really changed a lot was some of the stuff down south, like when McDonalds used to be there, which is now the district's main apartment building, or like the Duck Soup, which was like an antique shop that burned down.*

Memory is a very multifaceted subject for this group with respect to mobile locative media. On one level, the memory-assistive functionality of modern smartphones is highly valued, especially as seen in Roland's and Karen's approaches to photodocumentation, trip tracking, and email archiving. Second, members of the group articulate a strong comprehension of the fact that memory and digital archiving bring with them social expectations and boundaries, centering around "what is appropriate to archive" and "what is a reasonable/appropriate amount of information to retain about other people" in everyday interactions with them. Memory is also tied strongly to place associations, as Karen and April both emphatically point out. This seems to be associated with mixed impulses – at once to document what's fleeting about one's community, while at the same time expressing reluctance to use locative or annotative media with respect to the neighborhoods one has the strongest emotional attachments. The "closer to home" one gets, it seems, the more sensitive become questions about protection of privacy, or the subjection of one's home to the digital mediation.

Memory, and memory-assistive applications in locative media contexts, then, play a key role in the operation of locational literacy. Technical proficiency matters, but so too do cultural and personal values regarding feelings about privacy, the memorialization of locations with strong memory associations, and an awareness that changes in memory-assistive devices and software bring with them changes to interpersonal dynamics and expectations, which are also locationally implicated. Our locational literacy is modulated in complex ways with respect to our local, lived experiences in places, and how we remember those experiences through media that are both local and global in their extension.

4.5. The Political Dimensions of Location

The political dimension of geolocational media arises in strong correlation with mention of picture taking in public and institutional rules about use of public spaces. The political dimensions of location are matters these participants are keenly aware of, but in varied ways, due to their varied experiences with locative media and their social interactions. While social and political power strongly influences the question of who is allowed to photograph or document whom (or what), and in what circumstance there are also distinct differences in access to political agency among women as well as people from lower socioeconomic neighbourhoods or income brackets. Participants also

acknowledge sensitivities with respect to “filming close to home”, and how this works to discipline participants’ use of locative media. This has political implications, of course. The liberatory potential of locative media insofar as it may be used to question institutional power is also highly valued among this group, who acknowledge the potential transformative power of accessible locative media (especially with locatable photodocumentation). These political matters shape locational literacy in very important ways, which I then discuss at the conclusion of this Chapter.

Some of the discussion within the group about the political dimensions of location stems from the review of media logs, but the theme is taken up in a significant way after participants had a chance to review each others’ auto-documentaries. First, a discussion arose about sustainability and cities at the session where media logs were to be reviewed. This conversation centered around the sense of guilt and shame regarding unsustainable transportation choices, the impact of being told that “everything you’ve been doing is the wrong thing”.

The discussion then turned to focus on April’s self-documentary materials (videos, images, and an annotated map), which inspired much of the later discussion of the political dimension of geolocational media. Therefore, this section requires a review of that documentary material first and foremost.

April’s narrated Youtube video depicts her driving (as a passenger) through her neighbourhood. It shows a busy neighbourhood, on a sunny, clear summer day, with a dense mix of motorists, cyclists, buses, and pedestrians. Visually there are clear signs of transformation: buildings under tarps and screens, newly constructed buildings among older more dilapidated structures. Carnegie Centre is noted as going through a “facelift” (it’s got blue construction fences around it). It’s a neighbourhood with high rates of poverty, addiction, and homelessness.

As the filming is being done from a moving car (apparently with a high quality camera or cameraphone), there is much nuance missed (as compared to our previous sojourn, wherein I accompanied April on foot). April notes that the reason for this is that she has experienced aggressive behaviour and threats to her personal safety in response to her using a camera or cameraphone in public. April believes that this hazard

is amplified because of her gender (as a woman she is more likely to be the target of violence or threats of violence than a man).

The car passes by the building housing Vancouver Area Network of Drug Users (VANDU), which, as April notes, was the first organization to press for the introduction of a 30 km/h speed limit in the DTES. This speed limit was just introduced prior to the filming of this video. April notes that pedestrians in the neighbourhood often “dart out” into traffic, which is part of the rationale for the speed reduction. We observe at least two people doing this during the film. Relatedly, April notes that the open street market [a section of the DTES where residents lay out second hand (sometimes stolen) consumer items for sale to passersby] had moved westward a few blocks recently due to a flurry of street-vending and jaywalking ticketing by City bylaw officers near Hastings and Main.

The “view from the car” April provides gives impetus to a perspective that is “strategic” (in the de Certeauian sense) in nature – the detailed, personalized view of the community that April normally achieves by walking in it is seemingly supplanted in this video narration by thoughts about the planning, organization, ticketing, and overall health of the community. There is only one instance in the film wherein April actually converses with someone, shouting “hey Dave!” (to, presumably, Dave, who is walking on the sidewalk in a crowd). Dave waves back.

April also submitted an additional video (shot on Qik, an early video streaming service) showing the same neighbourhood in a somewhat different light. In this video we picture a wintry scene, from January 2011 (prior to the research setting, but April submitted this as part of her auto-documentary, so it is still a useful data point to contemplate). Snow is falling, and there is snow on the ground (a clearly recent snowfall). The roads are sanded, but the sidewalks are not. Some people are seen out shoveling snow. April and her friend are traversing on foot. The streets are noticeably less dense with pedestrians and cars than in the summer 2011 video. At one point we see a mass of pedestrians huddled under a wide awning (near United We Can). In a community where many people live outdoors, awnings become prime locations to reside in. Clearly locational awareness (and literacy) involves attention to these more unpredictable factors – forces of nature, weather, and the manner in which civic officials work to respond to those changing circumstances.

April also contributed a Zeemap, pointing out 26 points of interest or important intersections using red or blue markers (respectively) to mark important locations in her neighbourhood (Figure 9). They are all situated along the same east-west trajectory on Hastings between Abbott and Dunlevy streets. Most of the POIs are social service organizations (6). Three are SROs (3). One is an art gallery, one is a community bank, and another is a bottle refund depot. Only one (Army Navy Department store) is a retail business. Two (Megaphone Magazine and W2 Community Media Arts) are media organizations. 11 are intersections or public spaces (Pigeon Park, Hastings Street Garden). Only 3 POIs (all intersections) are located off Hastings Street.

April also provided 41 images, all screencaps from the video (Figure 11).

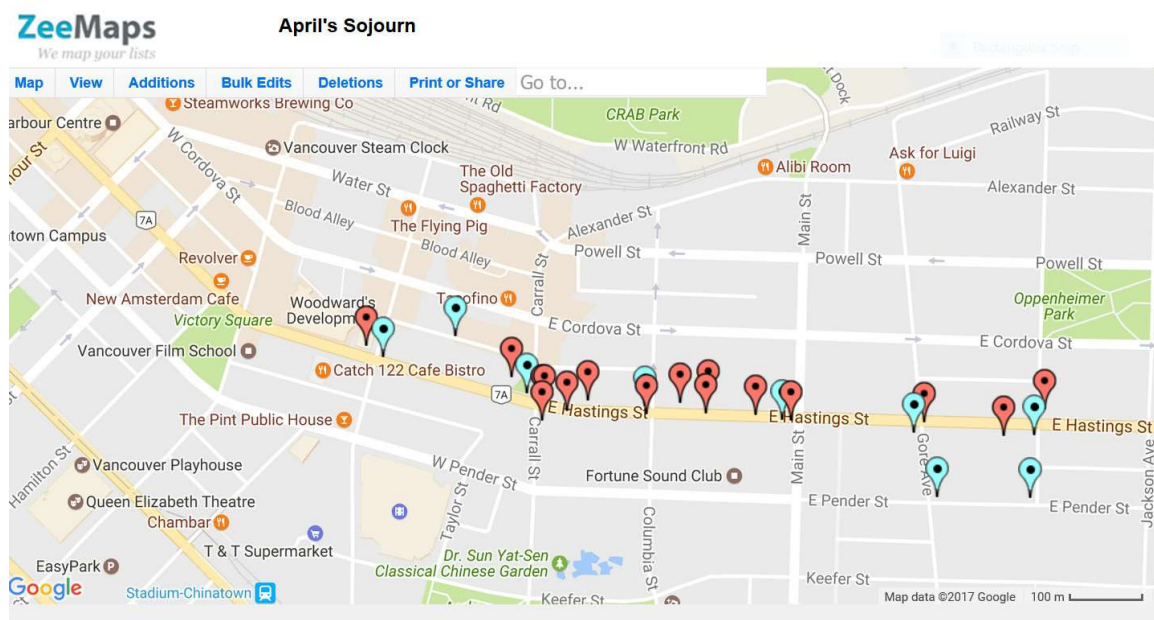


Figure 9: April's solo sojourn with points of interest indicated, using Zeemaps.

Much of the everyday reality documented in April's materials became focal during the group's latter discussions. At the review session (post-auto-documentaries), the group spent most of its time discussing the implications of politics and mode of transport – how these dimensions coincide to create modality-centered class divisions in the

occupation and use of public space. Primarily, this was incited by incidents experienced by April in her neighborhood, but the discussion sparked reflections on other participants' experiences, too:

Facilitator (continuing on the subject of photographing other people in public):
"What if somebody takes your media and does something reprehensible with it?"

Roland: *That's fine.*

Karen: *Breaks into a house of your neighbors?*

Roland: *There's nothing I can do, and I don't take pictures of my neighbor's houses. There's nothing I can do, good or bad."*

The discussion then turns to taking pictures of people in public for various purposes. "Accidental Chinese Hipsters" is cited as one example of this. Karen elaborates on the politics of these practices:

Karen: *It's interesting to me that we have the very personal feeling of being in urban space and seeing people, and having a reaction to them, whether it's positive or negative. Now, we're starting to get to the point where we're collecting those kinds of experiences to share those reflections and those emotional reactions with people in groups. I get anxious about where to draw the line, too. For instance, this one photo blogger, Tumblr, the first message on the site is, one of the top five messages in the stream right now is, "If you don't like what you're seeing, just go away. The laws around being in public spaces in America is clear, and I'm not doing anything illegal by taking pictures of people."*

Roland: *What are people objecting to? Oh, these are the transit people?*

Karen: *Yeah, because the people on transit are people who don't tend to know that they're being photographed. What's interesting to me is the contrast of that as a people watcher, or somebody who's interested in transit, or people who's interested in the stories that people tell each other about what's it's like to be in transit and be in urban spaces. There's a very fine line between that and some of the crazy panty shot shit. There's only a difference in intent, essentially. I find that fascinating."*

Further discussion of what constitutes private or public space ensues, with respect to transit vehicles:

Facilitator: *You're saying that transit is not the public?*

George: *You have to pay to be there.*

April: *Yeah, it's a form of private property. That's kind of what you're saying. It's government based.*

Scott: *Yeah, it's an enclosed space, limited public space.*

George: *In any in-public space, whether it's limited public, or transiting public, I'm uncomfortable taking clearly identify...I'm not a street shooter.. I'm not like...Who's that guy? The German guy, Herzog. I would never take those pictures. I would take pictures if their back was turned to me. I'm shy that way.*

Facilitator: *Yeah, I had this experience on Skytrain. I saw this guy on a wheelchair, and he had his phone strapped to his leg, and I thought it was interesting, but would I photograph it?*

[crosstalk]

Roland: *I'd take a picture of his leg, but not him.*

The group also discussed different international standards around technology design due to different cultures of public photography, and how this shapes the culture and politics of photography in public.:

Scott: *I saw a guy on Skytrain once who had a bionic eye. It was coming out of his face. I just thought it was the coolest thing ever, and I had to take a picture.*

Karen: *Did you ask him?*

Scott: *No. I sniped it, and it was loud enough that you couldn't hear the click on the camera.*

April: *Do all camera phones have mandatory clicks?*

Karen: *Nope. I can turn mine off.*

Scott: *In Korea and Japan, it's mandatory. Here, it's not mandatory. But, we get a lot of stuff from Korea and Japan.*

Karen: *It's mandatory to have that click?*

Scott: *Yes, because they have a major panty shot problem, especially in Japan.*

The group then discussed how these different cultures around public photography have implications for the persistence of data online:

Karen: *Yeah, and I'm really fascinated by that experience, because it's the persistence in the searchability, that's totally drives people off. They completely...I was talk to somebody about this too, where it's like, "Do you think people on Twitter understand, when they're public, that it's searchable and public?" I assumed, "Yes." That's because I still think that Twitter is an early adopter. I still think of myself as a fairly early adopter of Twitter. And, even though I was...I'm projecting my early adopter-ness onto the rest of the people who are further down the curve than I am...*

George: *That's the other reason why I don't take photos of people. I might take a photo where you can identify the person passed to you. What if you accidentally pass onto somebody and they identify that person? That's what I'm always worried about, not about me. It's about my friend.*

Further on, Karen discusses how practices have changed due to our awareness of the scale and scope of our posts:

Karen: *It's interesting that we start actually changing our intimate practices, so to speak, when we acknowledge both the intimacy of the tool and the potential for exposure and risk.*

George: *Say that person did a silent agreement saying, "I want my photo all over the Internet thanks to Roland."*

Karen: *Richard and I, for instance, we pretty much don't take pictures of each other at all because just too much crazy shit about sexting and all that shit, right?*

We just don't want there to be any question of whether or not something is going to get out there that we don't want. We just don't make it at all. It's interesting because, not that I know too much about my parents, but we could even be more conservative than my parents in that respect. In terms of how we use media as expressions of us being human beings.

However, Scott has a different perspective on this matter:

Scott: *No, I don't make pictures public. The only time I release a public picture is that there is some reason. I am doing a presentation or some other occasion, it would just be self-promotion. I have been pretty slow coming to social media given my overall technology bent and partly because I think when social media was rising I was in full-on media activism. I was much more into circles where people did not want their identity known, shared and their activity tracked and all that kind of stuff. There is a disconnect there for me doing that. Now that I am less in those things, Bitcoin sucks up a lot of my attention these days and there are a lot of people out there who are like "I do not want to be known, I do not want my identity, the company is coming down on us soon or I stop".*

Clearly, there is a range of approaches to the question of what ought to be private as against what is acceptable as public information. Probing further, I then asked participants how they think things might change in terms of how we make use of geolocational media on the go. Participants express trepidation for institutional controls being put in place:

Karen: *I anticipate that one day, they'll have something legally required to be in my bike, and then there'll be something legally required to be in my iPhone, that will not allow me to play my iPhone while I'm on the bike.*

Roland: *Oh, I hope not.*

Scott: *They're getting a patent so that they can shut off video and camera remotely*

Karen: *Exactly and the other thing is I could see police. I could see police deploying little field triggers on media devices that you can't film them during certain times.*

Scott: Or checking into your logs, see how fast your vehicle is moving at.

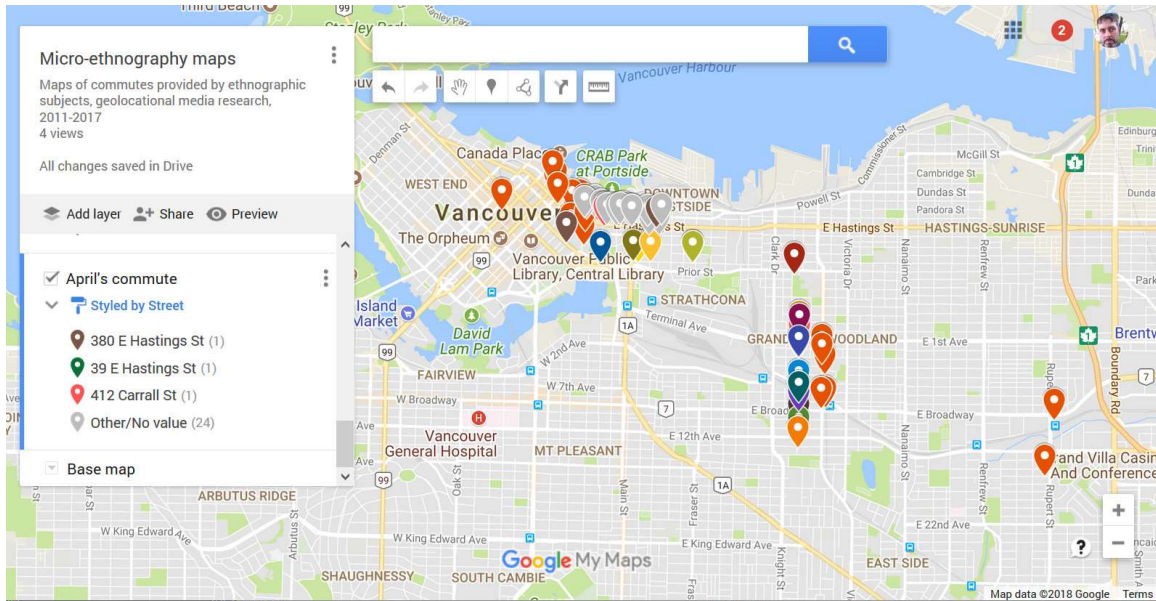


Figure 10: Screen capture from Google MyMaps multilayered collection of participant-submitted .kml files (created using ZeeMaps or Map My Tracks)

Further dystopian worries haunt Roland's and Karen's later thoughts about cloud photo archives:

Roland: *Are you worried that some day you're going to have a DMCA or Patriot Act take down of your archive online?*

Karen: *I have to be open to the idea. I have to be open to idea that I also, that my Twitter account might be scooped off the face of the Earth and then...I did watch "The Net" as a nine year old so...It's never far from my mind.*

On urban anxieties, alienation, and the dehumanizing, objectifying condition of urbanization, Karen discusses how the tradeoffs with living in a city can be seen as parallel to the tradeoffs with invasive technologies:

Karen: *I started watching "Dollhouse" a couple of weeks ago and I realize that the whole narrative and the anxiety that we have around urban amenities played out in that show. We like our amenities. We like that we're not carrying around the weight of the village every time we show our face in public, but we are anxious*

about what that means for our sense of community and belonging and the fact that where essentially interchangeable with any other person, that face the crowd.

I think that anxiety plays out on the technology as well, whereas you don't know the intentions of the person that you may be interacting with. It could change tomorrow even if they themselves are presenting the same physical fits...I think the anxiety...You can see it in the sort of global conversation around things like extremism and what not because the whole anxiety about religion or the Islam phobia or the fear of difference is about the fact that you don't know where people's allegiance lie. The commonality of civility or the idea of civil sphere, or public sphere is the counter-balance to that. We want to be able to have...A level playing field or common ground or respect for each other comes from...We're anxious to have that conversation explicitly, because it feels standoffish or it feels like it's one of those things that shouldn't everybody know it? Shouldn't everybody just know how to act in public? And our anxiety about the fact that, actually, a whole bunch of people don't.

So the politics of location are, for some, experienced as a site of trade-offs between affordances (what Karen here calls “amenities”) and the tolerance of regimes of surveillance. Urban space is seen as predominantly public, and therefore something to which individuals can claim democratic rights to, but increasingly there is a sense that that democratic character is compromised by institutional demands. It seems that these institutional demands are acknowledged as unassailable in many respects.

In this sense of the politics of being locatable, and in reference to his filling out of media use logs several weeks previously, Roland expresses a reluctance to document his home neighbourhood, reasoning as follows, and in so doing, identifying a key tactic that urban residents may use in resisting a regime of continual surveillance by institutions and big data:

Roland: *The other thing I'm not doing is I'm trying not to take photos of my neighborhood, because it's pretty obvious where I...*

Karen: *Over-saturated?*

Roland: *Well, I don't want that and also I don't want people to know exactly where I live, so I try to turn the GPS off when I get to within a kilometer of where I live.*

Karen: *That's what Richard does, too.*

Facilitator: *Are you in the phone book?*

Roland: *Pardon?*

Facilitator: *Are you in the phone book?*

Roland: *I am in the phone book, yeah, I know that. I know that's hypocritical but hey, I'm on the edge of the igloo so I'm full of hypocrisy.*

Karen takes a similar attitude to this topic, discussing some of the tactics used to conceal her location with respect to identifying her home:

Karen: *It's funny that my location practices are very much... I tend to have... well Richard is a little bit like my... I'm always in relation to him, so for instance, he does a lot of tracking in RunKeeper for his bike rides. He'll usually cancel the last three points next to the closest intersection so that you can't figure out where we live. I don't use location as much. One reason for that is because I'm on the 3GS and it's pretty old, I just turn location off all of the time. I forget to turn it on sometimes, I turn it on pretty much to check into Foursquare and even that. The thing that's been interesting to me lately is...*

On the use of geolocational tools, Karen expresses some reluctance to use them with respect to more familiar neighbourhoods where she feels strong attachments to place:

Karen: *I have a huge attachment to the neighborhood that I live in. I will talk about it to anybody who knows me all the time. I don't find myself using location a lot. I don't location tag my tweets automatically, for instance, it's off by default most of the time.*

George: *Oh, I don't do that either*

Karen: *It's interesting because as a researcher, I've been curious about starting to use it. I haven't had a chance to do that yet because the tools I have used haven't been that accurate.*

This, at least, is a tactical move which all participants agree is a valuable piece of their survival in a world of locatability. There ensued, subsequently, a lively discussion of some of the more problematic political implications of geolocational data. In part, these discussions were in response to facilitator prompts wherein each participant was asked to think of two words to describe the political experience of geolocational media at that time in their lives.

When asked to summarize his experiences with locative media in two words, George chose the words “Etiquette” and “Offline accessibility”. George’s experiences are mediated by the fact that he is a film student. His experiences have been in groups, and he’s come to avoid situations that have potential conflict.

George: *I used to wander around downtown and do some street photography before I had established very clear lines on how I felt about taking pictures of people and that kind of thing. I've been approached and been challenged... People say, "Hey, it's illegal to take pictures of me." Are you going to do a debate like "No, it's not. It's only illegal if such and such"? It's easier, I find to avoid that kind of thing... Most of the time for photography I avoid...I don't like photography like that. I don't look in everyone's drawer, but as far as doing it myself its sounds like a bit that interests me. Maybe that's because of all the mental barriers involved with...should I be taking pictures of these people?...Even educators seem to pass off the release form thing every once in a while, which feels like they should be teaching us absolutely what's legal. You realize what's a bit more flexible than that...When I hear the amount of bureaucracy that's involved in doing that kind of thing, I agree that I'm not going to shoot or anything in a public space. It's way cheaper because you don't have to pay for permits from the city to film outside. You don't have to worry about people being in your shot or your audio being screwed up because somebody wants to yell and try and get into the film or anything like that.*

When asked to summarize her experiences with locative media in two words, April chose the words “Chaotic” and “Frenetic”. She clarified her choice of terms by

elaborating that she does not feel she is sure where to begin with creating social change, though she expresses much excitement over new media technologies in general. April has a different experience of Vancouver than the other participants – one that carries personal risks, as related in this account:

Facilitator: *Are there tactics that you use in that alley, that's helping you make that decision, like who's usually in that alley, and do they own it? April?*

April: *Yes.*

Facilitator: *It affected your entire sojourn.*

April: *Absolutely.*

Facilitator: *You went in a car.*

April: *I had the opportunity to go in car, because prior to that day, I was all geared up to do my usual walking tour of my own usual journey. I got knocked down really hard.*

Roland: *I didn't realize you actually got knocked down.*

April: *I did. I was unconscious for a while. I was like, "OK, I'm not going to do this." One of my classmates said, "Why don't I help you do a tour?" That's when I did a disclaimer. "I'm not usually doing this. That's why I also put that adjunct video that I walked in the wintertime, to showcase, "This is an example of me going up, livestreaming and so on."...I guess it was the time. I think it was mid-month, so people get their check and they go crazy. There's a lot more drug dealers. There's lots more cops. I was in the wrong position at the wrong time, and a girl that I thought we had given each other the OK for me to walk by and film - I was filming for something... and she came up and [makes gunshot sound].*

Facilitator: *It was a woman?*

April: *It was a woman dealer. A big, fat, aboriginal woman dealer. She later apologized to me, because I went like that. She's like, "I thought you were someone else." I'm like, "What do you mean?" I'm freaking out. She's like, "Oh, I*

thought you owed me money." I said, "No, you didn't. You thought you could get something off of me."...I had to use my hard-core community connections to say, "Look, I'm good, and I'm not one of the..." She thought I was either a narc or a rat or undercover or DEA or CIA or anything like that.

April's experience speaks volumes about the micropolitics of cameraphone filming in public, and how qualitative differences in experience (for both the photographed and the photographer) cleave along lines of class, race and gender. In a city as class and race divided as Vancouver (notably so in the DTES, where multimillion dollar condominium residents commingle with a large community of people who suffer addictions, mental illness, homelessness and poverty), residents doing any sort of filming need to be far more circumspect about their practices. For mobile photographers like April, the amount of circumspection required is heightened, due to the increased vulnerabilities of being non-white, female, and not affluent (as is the case with April).

***April:** I woke up at Insight. The nurses were doing nurse patrols, and dragged me there or whatever. I was like, "Holy shit. I could have died. I could have been robbed. I could have been molested, assaulted, raped, any other thing." As a woman, I'm pretty fearless. Walking in the Downtown East Side, people know me, but anytime, something could strike... For whatever reason. I looked at her funny, or she thought I was someone else. I try to be as anonymous as possible. I always try to wear a hat or a hoodie. It was a weird experience. I still try to persevere and still get the information because, like what you say, having these maps, it's an experience that people should know about... If you look at a map through here, and you're a tourist from Paris, it's going to be a lot of a different experience than you and I going through it, going, "Oh, I know this. I know this. I know this." I'm going to have to rethink my own strategies of going in my community now... I haven't actually worked in the community for about a month, because I've taken another part-time job out of the area, up by Granville Street, maybe my face isn't as familiar. There's different drug dealers, different street people, all the time. She might have thought I was someone else.*

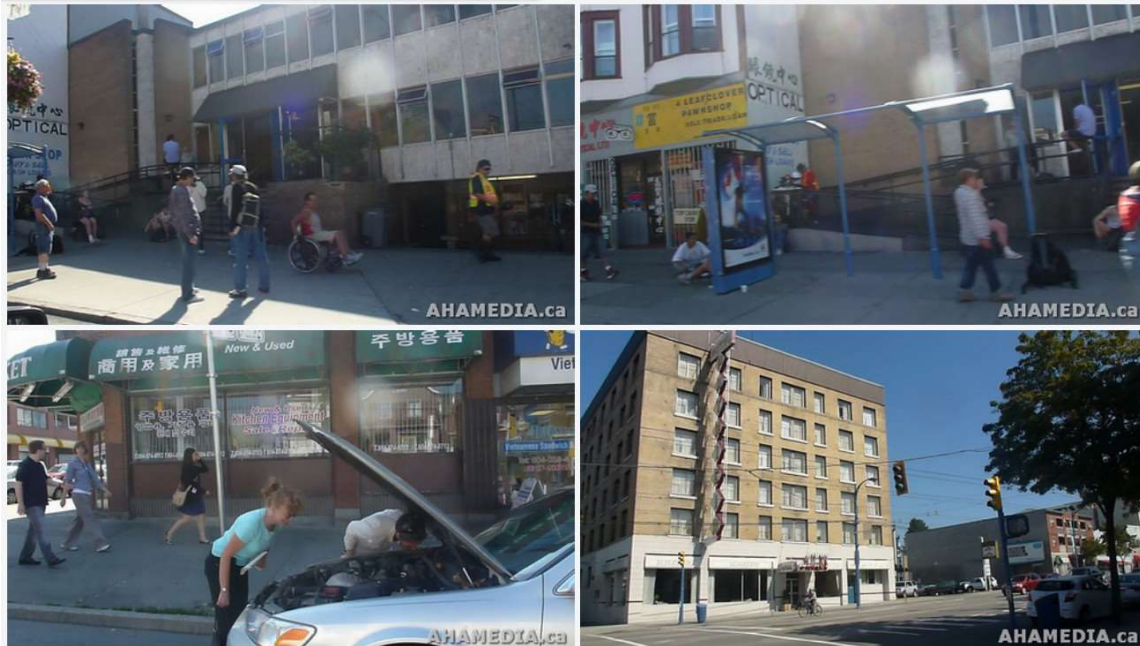


Figure 11: April's solo sojourn screencaps, Vancouver's Downtown East Side neighbourhood

April then relates how the very fact of being in a car is a sign of affluence in her neighbourhood. Since the incident above occurred, April filmed her commute from the relative physical safety of a friend's car (the perspective depicted in Figure 11):

***April:** I felt elitist, actually. [laughing] I was like, wow, I'm actually in a car. I felt so bad. I was glad to have that experience but I was mixed. I felt almost guilty. I see all my friends and they are waving, "Hey, how is the going?" and they're like [Whispering] "Why are you in the car? How dare you be in the car?" Elevates me in a hierarchical status. People came up to me and say, "Aren't you the Queen?", "Aren't you so fancy?" It's a mode of transportation. "Why are you doing this?" I am doing this for research project, "Are you too good for us?"... I know some people in my neighbourhood that I didn't wave and they give me attitude like, "You have become one of them, instead of one of us?", "You are looking in on us like this African Safari tourist photographing us like animals." I'm like, "No, that's not the point." I told them all about what we are doing. I told them I also have street cred time and I want to be with you guys, "No you are not." "What do you mean? If I had gone drunk and high you would love me but just because I took that one step up and out." There is that invisible barrier, there is a physical*

barrier... My friend who was crying afterwards said, "Why it's just a car, it's my mom's car." It's not the point. I am with this people and he works in the area too, he is a mental health worker and he is also taking my class. He like, "I don't understand." I said, "You won't understand unless you lived a life of downtown insider."

Intriguingly, April invokes the idea of being in a car filming a city to that of a person on a safari filming nonhuman animals. But still, as she argues, there is an invisible – yet “physical” - barrier between her and her subjects/acquaintances. This barrier can only be transited by living among them as one of them – partying with them is the only way to earn citizenship in this community. Being behind a camera not only precludes this membership, but erects an additional layer of social distance.

***April:** I think they almost cocoon themselves and become a very insular experience, for them to see me if I walk around with my cameras and cell phones, "How is the going?" It's fancy, when I had nothing on, everyone was open, everyone was friendly, zipped through frustrated drug dealers [laughing]...I thought that I could maybe replicate that experience but at a more leisurely pace because you know we were going to pretty good clip... Going through that car experience it made me realize how much I do value walking around. The freedom that I do get from walking around with the camera or at a phone being able to talk to people. It's something that, for now, I don't think I can replicate because of my accident... going to call [laughing] my workplace accident.*

April relates a parallel experience in a classroom setting, when casually photographing a guest lecturer:

***April:** I have to give thanks and blessings how welcoming the social media committee here in Vancouver is because I'm so used to click, click, click and tweeting and Facebooking. It doesn't matter. It's expected of us. We're always going to be documenting in some ways. If I tried doing that in class, I will get my head ripped off by the professor. I took a photo of the speaker. He was an AIDS activist that we had met today at the Insight conference. She comes over and reprimands me. She said, "Oh, but can I have your footage of the thing you shot at the panel last week?" I said, "What is this?" I'm struggling with that. I want to say to her, "You know what? If you want me to document it, you can pay me*

blah, blah, blah. If not, leave me alone." I take photos because I'm a visual learner, and I want to be able to document. She doesn't understand the concept of mobile apps or technology or social media. It's still very like, "Here's your art book." See? Here's my homework. "Decorate the front of your thing." Her feedback, it's like I'm in kindergarten. This is an SFU certificate course that I'm taking. I'm like, "Wow." I'm not going to talk about her technique.

I interpret this narrative as follows: depending on the contextual details (classroom assumptions around privacy of exchange), reactions will be scaled to fit the situation. Whereas the community of the DTES is a public setting, some residents actively police photodocumentation as a survival strategy. Similarly, a lecturer speaking in a classroom expects a certain level of privacy that social media documenters sometimes neglect. This may say more about April's limited experience in university classrooms, however.

Interestingly, April also recounts her coverage of a public relations event at Insite (a DTES supervised injection facility), wherein a CBC crew arrived and tried to crowd her out:

***April:** You guys all want to know what happened. Of course, the cameras sweeping and everything. For me, having invested three hours before the actual press conference time. The press conference was called at 6:30. Hooray. We win or we lose. The CBC comes in. They roamed with their big trucks and their big cameras. The CBC squashed me up against the window. He tried putting the camera on top of my head... If it wasn't for one of the city councilors who'd say, "You know what? April has more right than you to be here. You can move back and give her some room", so then I can film. It's important.*

Karen replies by narrating a recent experience with using video in a class about engaging communities and policy with video, and recounts how a student who produced a film as a thesis project was strictly limited in terms of how the film could be used outside of the educational context - it could not be posted on the internet. She concludes thusly:

Karen: *danah boyd says that “public-by-default is only an acceptable policy if you are not a subject of power.” If you are already in the position of power, where you don't feel that what you say or what you do or somewhat other people do or say about you is going to be used against you in some fashion, then you feel like public as default is not problem.*

I return to a discussion of some of the implications of April's rich account for locational literacy (as I have defined it) in a moment. First, though, it is helpful to recount how the remaining participants summarized their experiences with the politics of locative media at the concluding meeting.

When asked to summarize his experiences with locative media in two words, Roland chose the words “Simple” and “Low-tech applications”. He believes that software firms over-analyze things. Community-based development is what he's actually proposing. By “simple”, he clarified that he really means “Organic”. Geolocational media and devices have altered his perspective on his urban surroundings, particularly with respect to photography, which he says has caused him to reconceptualize his movement in terms of maps and data points.

Roland: *Since I have had the camera phone in 2004, it's totally changed the way I look for photo angles. I look for things to take pictures off. I also imagine since 2007, when I got the GPS, I also imagine how this will look on a map...because I have all these very vague ridiculous ideas about mapping... You know like...I will make a map of all my commutes via bicycle on year 2000-2007, 08, 09, 10, 11 and compare them. I'll take a map of...I am always thinking of those things, I don't know about everybody else.”*

Roland, like other participants, sees that the “mundane” experience of everyday urban life, a city as lived by its participants, is an important story, and one he tries to document with his constant picture taking:

Roland: *What I like and I have always liked is the insider slash “mundane”, as Richard called it, view of the city from people who live there. I like the fact that some people deliberately -selectively - ignore their surroundings, like George. He didn't bother to mention SkyTrain because he hates it...I like the fact that as*

insiders, as locals who live in the Downtown East Side...We can see the points that are of interest to people who live here as opposed to Stanley Park - which I love. Don't get me wrong ... and Granville Island...again which I love... You get to see the parts of the city that you would see if things were pointed out by local people and their mundane lives are...our lives are mundane in a good way. I've always wanted to get that kind of mundanity documented... What the Parisians do? The people who aren't rich. New Yorkers who don't live in Manhattan or Brooklyn? What do they do? What's their life like?... We can get the sense of it. None of us are rich. None of us live in Coal Harbor. None of us live in the West End. We all live in neighborhoods...and in states that aren't rich ones. Although they are rich in their own way...They are First World in their own way but of course... I think there is a social network there, or there is a book there, or there is a film there...

Scott: *or a thesis.*

Later, Roland discusses how his experiences with respect to safety as a bike commuter have actually made him “more blasé, but also at the same time more discerning” in the way he navigates the city. This – which is a political matter, involving the orderly and sometimes fraught interaction of people operating different types of vehicles on city street – clearly affects his photodocumentation practices:

Roland: *That was an interesting thing because for whatever reason there was a lot of partying going on there, during the Olympics. Every other day there were beer bottles pieces on the sidewalk. I couldn't doge them. I got two flats.*

Facilitator: *Oh, two flat tires, I thought you had collected two flats.*

Roland: *Nothing will protect you from a piece of glass that you don't see, that's this big. Unless you have like pneumatic tires, or non-rubber tires. It hasn't changed, I've gotten more...*

Karen: *Discerning.*

Roland: *More blasé, but also at the same time more discerning. I think more observational in my photos. I try to take different photos. I take fewer, but I take different ones.*

Roland also talks about his comfort level with respect to photographing identifiable individuals, and how being behind a camera is similar to the alienating perspective afforded by driving in a car:

Roland: *I do feel different in a car, but I'm a lot more conscious of it than I used to be. I grew up in the suburbs, and I grew up driving everywhere. It's taken me a while to realize that there is this distance thing...I don't get it until I hear of April's experience. I don't get it fully. Also, when I drive the Downtown East Side, I feel that way. I feel like there's a disconnect here between me in this comfortable car, going at 30 or 50 or 60 kilometers an hour and what's happening on the ground. You don't feel that way as much in the other parts of the city because...*

April: *Everyone's got a car.*

Roland: *Everyone's got a car or...It's just different. I also feel - for the same reason that you don't feel comfortable walking by yourself or filming by yourself as you had previously - I've never felt that way in any part of the city. I don't feel comfortable. Maybe it's my small town upbringing. I don't feel comfortable. I've never felt comfortable filming strangers or shooting pictures of strangers, unless it's their backside or you can't see who they are...I've never felt comfortable being the street photographer, being the...What would the word be?*

April: *Community photographer?*

Karen: *Flaneur.*

Roland: *I never felt the flaneur role...I never felt comfortable with it. Even if I had a toy silent camera with a humongous zoom lens...I still wouldn't be comfortable because I feel like, "These people are my fellow citizens. They didn't ask me to do this...".*

Taking this analogy one further step, Roland then compares act of photographing to an act of violence, or trespassing where we aren't permitted to go:

Roland: *I think that's gonna happen. I think people by default upload to either a totally private place, either upload it to a place where only a few people can see, which is the right default. I'd like to have the other*

default. I am disciplined enough not to take pictures of criminal acts, or kids or...

April: *Obscene...*

Roland: *Whatever.*

Karen: *I mean...you are also assuming that you hardware is not going to get stolen.*

Facilitator: *There's permissions...Places you're allowed to go that camera eye can't, can't capture them...*

Roland: *I think I have always been paranoid about getting thrown in jail and getting arrested.*

April: *...And getting your footage seized.*

Roland: *I have a total history of self-censorship....I do it all the time.*

When asked to summarize his experiences with locative media in two words, Scott chose the words “privacy” and “Digital Divide/Access”. In interviews, Scott spoke often about mental augmentation as well. He explained how status display and more utilitarian concerns influence his choice to use a device while interpersonally interacting with people, which leads to an insightful exchange:

Facilitator: *Do you Google stuff on your phone when you're walking?*

Scott: *Yeah, for sure. I would say, one thing's you talked about mental augmentation, the number of spirited debates, if you want to call them, or arguments if you want over the details in trivia is gone from my existence. It's like, "Did such and such happen?" It seems so weird now to even argue over a statement or fact when you can look it up. [laughs].*

Roland: *This argument that you can resolve it at a bar. You don't have to be at the computer lab or your home.*

Facilitator: *Does that change the way you interact with people in public?*

Karen: *I know that Alex Samuel used to talk about it as the fear of being wrong and part of it is that you want to rush over to the definitive Internet in order to settle it once and for all. What's interesting is that you get the underclass and the higher class conversations... A higher class conversation tend to be the ones where there is no easy answers that the Internet can tell you. That's the kind of opinion that only comes with really deep engagement in a topic of the scholarly sort because I'm working in academia, but I think it projects a different kind of patience involved if you want to be deep in probing somebody's experience or their opinions... I was at a coffee or a bar last night having a conversation about transportation, and it was like, even though I knew I had all the facts, and I'm very set in my opinion it was like a very conscious... They're talking about their experience, to which there is no definitive meets or because you can't question the authenticity of their experience.*

So there is a primacy accorded to immanent experience, as Karen says here, over transcendent knowledge. This is an intriguing premise – that our immediate experience of the world has a stronger – or at least substantially different - claim on truth than does a more abstracted, planned, reasoned interpretation of the way things are.

In contrast, Scott observes how the utility of “top down” knowledge obtained from maps is more useful in special contexts (as distinct from using it in everyday local contexts):

Scott: *I know the city well enough, that I don't use the maps and all that stuff that much. Not even street view unless I want to confirm which is an address. What does it look like there or something like that? That's a totally different experience to traveling somewhere. When I was in England for a month last year, the amount of use this got on maps, and directions and all that stuff was just like...*

Facilitator: *It totally changed your traveling.*

Scott: *Totally changed my traveling style.*

Scott then discusses some of the everyday tactics involved with filming unobtrusively in situations where we are putting powerful institutions and individuals under the spotlight:

Scott: *It doesn't matter to me. I've have been, right with the riot cops or like cameras in the court room and all of that kind of stuff. Getting through those places where cameras weren't allowed in until we were doing it. Part of the skills and stuff that you learn with that, of course is to be unobtrusive with the camera, unless you want to be obtrusive. Of course those cases, when you want to be obtrusive are where there is potential of doing something to prevent abuse of power, like police beating people or whatever...There you do want to be, "OK, make sure the tally light is on. Make sure the camera is very visible and all that kind of stuff." Other techniques were less obtrusive, which I think is - now that I think about it - becoming ingrained is, when am shooting something and it's unconscious because I do take whatever pictures I feel like taking. Some simple techniques for doing this is, making a picture of the room is what you are looking at, and you happen to be capturing people as well in it, if that's what you want.*

When asked to summarize her experiences with locative media in two words, Karen used the words “convergence” and iniquity”. For Karen, at times geolocational technology is an unnecessary impediment to orienting one’s self in physical space. She recounts an experience in Seattle where relying on Google Maps sent her in the wrong direction, and elaborates on the frustration of this experience:

Karen: *I was using the Google Transit a lot in order to tell me how to get from where I lived to where I was going. Google was really wrong in several respects because it would tell me to try and walk...It would...I call that "false connectivity"...that was me realizing that, it was I who was over reliant on the technology or that I had to learn to read the map to get me*

information that the map wasn't giving me. That I had to impose my own interpretation of the instructions that it was giving me.

However, Karen also recounts how the expectation of having the comprehensive “planners” view of the city is something she took for granted and missed once she had lost it. On the other hand, she notes, the experience of having digital assistance to navigate urban environs is not yet mature, in her view:

Karen: *I think it's shallow right now because we can agree what a good restaurant is or a bad restaurant is. One of the things I found interesting is reading and writing your experience is that you were talking about how, walking around the streets of the Downtown East Side with a camera, was going to be physically threatening to you.*

April: *It was.*

Karen: *It would put you in a position, where you were compromised and where you didn't have power or where, you invited yourself for being questioned or being challenged for your presence on the street in that particular mode... I thought that was interesting because that comes from, you knowing that neighborhood and you being...I imagined that you must have an incredible database of faces and names in your head for people who are there and also not only who they are but your previous interactions with them... That was interesting to me because, I envision a place like Hong Kong where it's crowded but there's a little sense of anonymity. I think part of what we're seeing with all these systems is the aggregation of the kind of knowledge that we get from being inhabitants of an urban space, that kind of tacit knowledge, I guess it's called, where you only get it by being in that space by doing those things or by going to those places...where we can agree on what a good restaurant is but it's much more challenging to say, people will tell me how to be safe in the downtown eastside or the right way to make eye contact, or the right way to tell someone go away.*

This raises the point (among other points already elaborated in this Chapter) of the gendered character of the experience of urban life, and how technologies play a mediating role in the negotiation of power, agency and structure. Karen expresses how these questions aren't being addressed by LBSN developers:

Facilitator: *There's things that these assistants or these virtual sort of extensions of our tour guides, they don't touch?*

Karen: *I would imagine that you might start getting location based social networks for organized crime, for instance. I bet, if they felt like putting the time into it they would do it. The negotiations are, who gets access to what? For what purposes? I feel like those are the questions that aren't being graveled with, around the sort of urban experience. When I think about the kinds of knowledge that I have just from using things, I mentioned in the Wiki page that I created that, because I use the transit system so much I know where all the dead spots are, on transit. Like the entire tunnel between Waterfront and Stadium Center. It's kind of the same old way that I know what the dead spots are in transit. I know the places that are hard for me to get to, because of the way the buses are laid out.*

In closing, Karen recapitulates the important role of reciprocity in pedestrian life (in response to April's account of driving):

Karen: *I feel like what you're describing is the fact that when you're a pedestrian, there's a sense of reciprocity with the people you have on the street. They can see you looking at them, and you can see them looking at you.*

April: *It's more equal.*

Karen: *Whereas, if you're driving, you're not only at a distance, but there's the mediation of, "I'm moving at a different speed than you. I could take off." Or there's a piece of glass in between that may or may not be tinted. I'm in a vehicle that is designed to take me a lot further and to go in a different place, literally.*

It implies destinations that are much further out than most people in the downtown east side are going to be preoccupied with.

In summary, the political dimensions of location are matters these participants are keenly aware of, but in varied ways, due to their varied experiences with locative media and their social interactions. They acknowledge that social and political power strongly influences the question of who is allowed to photograph or document whom (or what), and in what circumstance, as indicated by the examples raised by April and Karen. This points to distinct differences in access to political agency among women as well as people from lower socioeconomic neighbourhoods or income brackets. Further, the sensitivities noted about “filming close to home” work to discipline participants’ use of locative media to some degree. Other participants express the liberatory potential of locative media in terms of documenting police activities and other expressions of institutional power. There is also a vague sense of excitement overall among the group over the potential transformative power of accessible locative media (especially with locatable photodocumentation), one that betrays some of the nuance here.

4.6. Conclusions

Based on the accounts and interactions of my research participants, the social contours of geolocationally mediated urban life pose several opportunities and challenges. These are informed by the preoccupation participants had with (1) the flexibility in perceptual awareness afforded by mode of transport, subject class, race, and gender position, and availability and conspicuousness of a handheld media gathering device; (2) the memory function of placemaking, as well as the implications of memory-assistive geolocational technologies and media; and (3) the experience of the micropolitics of space, especially as related to institutional rules about occupying space, and the political implications of geolocational sousveillance, as practiced by everyday urban residents with wireless camera-enabled handsets.

First, any technical innovation must be sensitive to the different informational layers that exist for different groups of individuals who occupy and use urban spaces. One person’s perception of the city may be entirely different from another person’s perception of it, depending on which layers of information are present and real to them among the myriad objects and persons with whom they share that urban space. The way

we make places out of spaces (that is, give space meaning by ascribing it placehood) works differently for each of us, dependent on our dominant mode of transportation, our subject position (race, gender, and class, predominantly), and our degree and kind of use of mobile capture devices like cameraphones. This corresponds to the “sensory” dimension of mobile interfaces as “sensory inscribed” (as discussed in Chapter Two). Modes of transportation and mobile interfaces both act as “sensing” devices in our “reading” of urban space. Mobile interfaces and transportation devices are also “inscribed” (in that they are used to display status or otherwise publicly demonstrate identities to others in our environment. While some of the participants’ experiences (especially April’s) indeed point to how transport modes indicate status definitions, among my research participants, mobile interfaces were contemplated as more predominantly “sensing” than “inscribing”. Moreover, when these two modalities – transportation and mobile interfaces - of “sensing” of urban space are compared with respect to primary and secondary instrumentalizations, the implications are complex and diverse. I develop this argument further in Chapter Six.

Second, innovations in geolocational media should be cognizant of the high value attributable to memory-assistive functionality. This is especially pronounced for longtime residents of a locality, for whom layers and layers of historical associations exist, and are rooted in place associations. In this instance, memory assistive functions of mobile interfaces - those that help us maintain an archive of our interactions – are as much “sensory” (augmenting our sense of the present with a greater horizon of memory, extending our “sensing” into the past, in a sense) as they are “inscribed” (contributing to our sense of identity and facilitating historical narratives about our relationships with others). I discuss the implications of this in terms of primary and secondary instrumentalizations in Chapter Six as well.

Third, innovations in geolocational media must acknowledge the political implications of arming urban residents with handheld capturing devices, with the expectation that these will be used for political and sometimes exploitative purposes. Cameras can be used to document police violence, but are also used to surveil civic protests and gatherings. The politics of who is allowed to film whom and in what place is bound to be an ongoing site of political contestation, and there is much resistance to the idea that institutional, state or corporate rule structures may be imposed on citizens’ use of geolocational media capture. There is also an increased awareness of the political implications of surveillable data footprinting by cell phone users, whose every

movement can be tracked by corporate, government, and criminal organizations alike. There are also critical differences between people of different genders and social classes with respect to how political power and agency are activated. This group of participants makes clear that the technologies used to make locatability possible and accessible by many warrant policy intervention, and rules about transparency of use, if ever the public is going to entrust their personal geolocational data traces with institutional bodies that ought to be accountable for how that data is used. The politics of mobile interfaces as image-, sound- and videocapturing tools is also described in Chapter Six, with respect to Farman's (2012) "sensory-inscribed" interface theory as well as Feenberg's (2002) primary and secondary instrumentalizations.

Locational literacy, then, as a constructivist project that emphasizes the "sensory-inscribed" nature of locative media interfaces, is articulated among this group of participants in a number of interrelated ways. Our sensory awareness of our environment is facilitated by – but sometimes constrained by – our engagement with locative interfaces, and this has some notable variability, depending on whether the interface at hand is a smartphone, or an automobile. Our use of these interfaces for "reading" or sensing urban space affects the structure and nature of information that we experience. One particular form of sensory affordance that can be enhanced by some kinds of locative media is in memory, especially in the connection of memory to digital archiving practices, historical information about locations, and personal place-memory associations, as discussed in with respect to the theme of memory. Locational literacy also has several layers of politics. Effective locational literacy depends on our adaptation to regimes of political and social structures, which have locational dimensions (what is public or private in one situation can change based on different genres of location that exist in our everyday lived experience). Effective locational literacy also invokes tactics like switching off location functions in sensitive locations, and seizing tactical opportunities to use locative media as an inscription device in the service of citizen journalism, which is counterbalanced against cultural predispositions regarding the ethics of public photography.

In the next Chapter I describe and analyze the results of a second phase of my inquiry into geolocational media: the design, implementation, and user testing of a sustainability-themed trip tracking mobile application. I then review the findings of this user experience research alongside findings from this ethnographic study, and then

scaffold these results onto the background of critical constructivist theory and locational literacy.

Chapter 5. User Experiences with a Sustainability-themed Geolocation App

5.1. Introduction

This Chapter reports on the research design and results of a project called Greenest City Mobile (GCM). As part of a broader research project (Greenest City Conversation Project, or GCCP), Greenest City Mobile specifically examined the role mobile and wireless applications can have in facilitating sustainable behaviours as well as providing a viable platform for meaningful dialogue about sustainability. With this study I sought to answer questions about whether (and if so, how) mobile phone and Facebook app users would alter their behaviour in response to application feedback about their daily habits (with transportation choices, energy consumption, and shopping). I hypothesized that users would do so if given (1) the opportunity to review their habits in comparison with the wider population of app users, (2) detailed information about how their daily actions resulted in specific greenhouse gas emissions, and (3) the opportunity to engage in dialogue with fellow users of the app.

I also hypothesized that app users' degree of participation and disclosure about their trips within the app would be affected by their awareness of being locationally tracked. It is this hypothesis that is of central concern in this Chapter²⁶.

As I will show in this chapter, the results of this latter line of inquiry – on location tracking - indicate four important findings. First, there is some evidence of a gendered dimension to attitudes toward locational privacy and urban life. Second, users who knew that their location was being constantly tracked (the Android app group) indicated no greater concern over their locational privacy than did the group who were not geolocationally tracked (the Facebook app group). Third, while users in both app groups exhibited no significant increase in their agreement with statements in favour of sustainable environmental choices after completing the study, they report otherwise in post-survey interviews. Fourth, concerns about locational privacy and urban life change

26. The implications for sustainability initiatives and behaviour have been disseminated elsewhere in more detail (Hebert, 2014).

in varied ways after participating in the study, and some of these attitudinal changes appear to be correlated with the use of the app.

While this set of findings runs contrary to some of the initial hypotheses, analysis of these findings (especially in light of post-survey commentary from app users) has produced several new questions for future research, primarily about the experience of wirelessly connected cities, ubiquitous sousveillance capabilities, and evolving conceptions of urban political power and empowerment (Farman, 2012). The findings raise questions about how using a location tracking or logging app may be associated with changes in levels of concern for data privacy (de Souza e Silva and Frith, 2012), and about how geolocational apps can play a positive role in reinforcing and rewarding sustainable choices and behaviours.

5.2. Background

Modern urban wireless media environments offer many social opportunities and challenges. Their technical infrastructure, which consists of (1) a network of location aware smartphones and other portable wireless computers, (2) urban scaled matrices of corporate-controlled high speed wireless transmission facilities, (3) integration of high speed wireless networks with IP based networks, and (4) large scale databases creates the conditions for an unprecedented kind of socio-technical milieu. This milieu is characterized by an increased connectedness to peers, family, and workplaces over wider distances in space and time; increased capacity for informed (and misinformed) decisionmaking in various everyday situations; increased capacity for wayfinding; novel opportunities for artistic and creative expression via new forms of interactivity; increased opportunities for businesses to create marketing campaigns and advertisements that are location-specific or that make use of the information created through the collection of detailed location data from wireless devices; new forms of political mobilization enabled by location-aware, portable devices; and increased capacity for government and corporate entities to make use of data big and local to conduct mass surveillance of citizens, for various purposes.

Of all of these practices that are amplified with the current set of available networks and interfaces, it is the latter practice – increased surveillance of data, both individually and in aggregate – that arguably attracts the greatest concern and debate in

both public and academic discourse. While we typically welcome many of the personal, political, and entrepreneurial opportunities afforded by our current technological assemblage, most of our worries center around the use of our personal data to track our location, our movement, our associations with others, and our activities. Surveillance as a theme is prominent in public political discourse in most societies around the world, and concern over protection of personal data is (or should be) a foremost consideration in any contract we enter into via digital interfaces.

The Mobile GCCP channel study began with this premise – concern for attitudes toward privacy and surveillance - as its starting point. This research premise was also specified to fit with a set of additional thematic concerns about public dialogue around environmentally sustainable actions, as part of a multi-institutional research project called the Greenest City Conversations Program (GCCP). My research within GCCP (called “Greenest City Mobile”, within the project group) specifically examined the role mobile and wireless applications can have in facilitating sustainable behaviours as well as providing a viable platform for meaningful dialogue about sustainability.

5.3. Research Design

Consistent with the goals of GCCP, and in an effort to better understand the social and cultural implications of geolocation media more generally (as outlined above), I created a location tracking app to test with a user group, in order to understand whether (and if so, how) people would change their beliefs, attitudes, and/or behaviour (1) under the condition of being knowingly geolocationally tracked and (2) under the condition of being asked to report and share their behaviours related to sustainability voluntarily.

I worked with a group of software engineers at UBC’s MAGIC Lab to design an Android app (and corresponding Facebook app) to be used for location tracking, trip reporting, shopping bag use reporting, energy use reporting, and chat functions. Users were recruited to use the app for a two week period, and were required to perform a minimal set of activities during that fixed period in order to be entered into a prize draw. All user activity with the apps was recorded, and users were surveyed both before and after the two week period to elicit their perspectives on sustainability issues and mobile device use. While many of the survey questions covered a wide range of sustainability-related questions to gauge users’ pre-existing engagement with environmental issues, a

subset of questions were designed to probe users' values, attitudes and feelings with respect to urban residency, commuting, locational tracking, and privacy (Appendix A).

Users were recruited via classified ads posted to Android user group forums, university sustainability email lists, and then more general student lists (university course lists and departmental lists at Simon Fraser University). Over a four week period, an initial pool of interest comprising 57 respondents was generated and contacted for follow-up. Of these, 33 users committed to the study by completing an Informed Consent form and an entrance survey. These 33 users were then assigned to two groups: (A) a control group (n=12) who were directed to use the (desktop only) Facebook version of the app (in which no GPS-based location tracking was used, and users were informed of this at the outset), and (B) an experimental group (n=21) who were given a link to download and install the Android version of the app on their Android phone.

The users were asked to complete several challenges within the app, and participate in at least one discussion forum conversation over a two week period. The Android group had their GPS data logged (they were instructed to leave their GPS switched on for the duration of the study). At the end of the two-week period, users were instructed to complete an exit survey (Appendix B). Users who completed the exit survey and all in-app challenges were entered into a draw for an iPod Touch.

After the conclusion of data collection, survey questionnaire results were subjected to exploratory statistical analysis. The user group is not a representative sample of all mobile phone users, nor all mobile phone users in Vancouver. The possibility for self-selection bias is acknowledged (users were recruited through both Android meetup groups, a university Communication department email list, as well as a university Environmental Studies department email list. Users were also offered a prize draw (iPod touch) as an incentive, which may weight the sample of users in a specific way. The sample sizes (n=33 at the beginning of the study, and n=21 at the conclusion of the study) are also not large enough to draw conclusive inferences from. The value of the study was not (and was not intended to be) quantitative but rather qualitative. By identifying the overall profile of the users of the app (demographics, media use, attitudes), one can compare and contrast this group with demographic and media use patterns in the wider community (i.e., the Metro Vancouver region), and therefore make inferences about how the wider population might respond to an app like the one used in

this study. Of the 21 users who completed the study, ten users had been assigned to the Android app, and 11 assigned to use the Facebook version of the app.

5.3.2. The Application – GCCP Mobile

The app used a straightforward design, with a simple set of cascading menus, and a map visualization interface. Users could select one of the three sustainability challenges using the main menu, as well as options to view a discussion board, leaderboard, and location tracking (Figure 12). On the Energy challenge page, users could input (using numerical input and drop down menus) the types of energy savings they had engaged in, which would then produce a calculation of approximate kWh saved by performing various reported tasks (turning off the lights before going out, using cold water instead of hot, and so on). On the Shopping Bag challenge page, users could input (using numerical input and drop down menus) the types of bag they had used at their last visit to a retail or grocery store (plastic, paper, canvas, none), which would then produce a calculation of greenhouse gases used up in the process. On the transportation challenge page, users could report their mode of transportation (pedestrian, bicycle, car, train, bus, SeaBus, etc.) and their start and end points for their daily commute on a map interface (Figure 13).

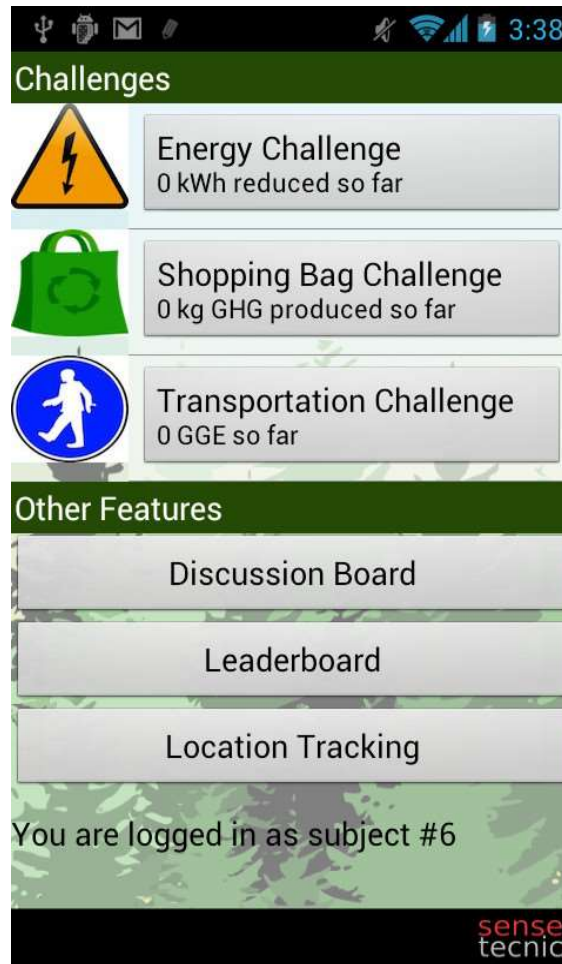


Figure 12: The Greenest City Conversation Project (GCCCP) Mobile Application Main Menu

From the Main Menu, users could also select the Discussion Board option, which would bring up a list of forum-style discussion threads. The Leaderboard function would display a ranking of users in terms of how many GHGs and/or kWhs were being conserved by other users of the app. Each time users made a report, they were prompted to start a conversation or leave a comment on a thread in the discussion board section.

The “Location Tracking” feature was switched on for some users, and off for others. Users indicated their consent to be locationally tracked at the outset of the study, and (provided they were equipped with an Android smartphone on which to install the GCCCP Mobile App), were included in the Android text group (n=10). A parallel group was classed into the Facebook App group (n=11) – a version of the App that did not automatically track users’ movements – as a baseline group. There was no option to turn

location tracking on or off, but each user was informed at the outset whether they were being tracked or not.

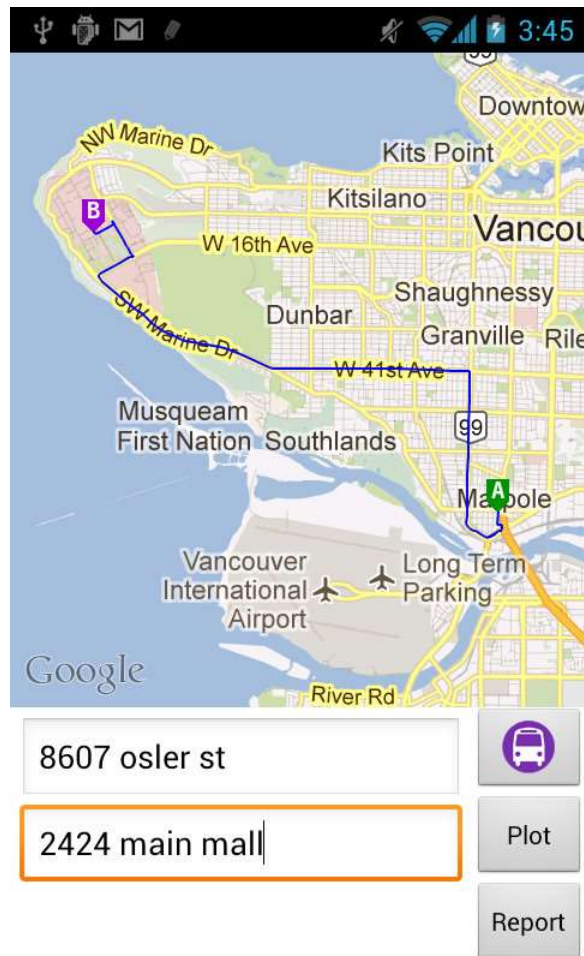


Figure 13: Transportation Challenge Interface

5.3.3. Survey Design and Methodology

With the survey and app testing research, I looked for answers to four primary questions:

- (1) Are there any correlations between demographic characteristics and attitudes toward (a) privacy, (b) urban life or (c) sustainable choices?

For the purposes of exploratory statistics, the present study is limited to analysis of gender, given the small sample size. To answer this set of questions, male and female-identified respondents were compared in terms of their responses to a series of questions covering each of these three topic areas. The comparison was performed pre- and post-app use. (For the “privacy” topic, Appendix A and B, Questions 25g, 25h, 25i, 25j, 25k, 25l were explored; for the “urban life” topic, Appendix A and B, Questions 25a, 25b, 25c, 25d, 25e, 25f were explored; while for “sustainable choices”, Appendix A and B, Questions 13, 14 and 15 were explored).

(2) Do users who know that their location is being constantly tracked express greater or lesser concern over their sense of locational privacy than individuals who are not geolocationally tracked?

For this question, users were divided into a control group (Facebook app, not tracked), and an experimental group (Android group, tracked), and their responses to several survey questions were compared (Appendix A, Questions 25g, 25h, 25i, 25j, 25k, 25l).

(3) Do users show any differences in their agreement with statements in favour of sustainable environmental choices after completing the study than before using the app?

For this question, all users pre-app use and post-app use were compared to look for significant changes in responses to questions about sustainable behaviours (Appendix A and B, Questions 13, 14 and 15).

(4) Do users indicate any increase in their concerns about privacy after using the trip tracking app?

For this question, all users pre-app use and post-app use were compared to look for significant changes in responses to questions about privacy (Appendix A and B, Questions 25g, 25h, 25i, 25j, 25k, 25l).

5.3.4. Sampling Considerations

The small samples sizes of both the pre-app use group (n=33) and the post-app use group (n=21) prevent meaningful statistical inference in most instances (i.e., Likert scaled responses break down users into five categories, which makes comparison of responses to one Likert scale question to responses to a second Likert scale question statistically meaningless, as the numbers of respondents to each of the five responses are usually much smaller than 20, and, in many cases in this study, smaller than 10. For the purpose of exploratory analysis, in most cases, the Likert scale response questions have been downsampled from five to three response categories, collapsing the “Strongly Agree/Agree” and “Strongly Disagree/Disagree” into singular responses (“Agree” and “disagree, respectively). Other questions – such as demographic questions or ranked lists of mobile media activities, for instance – break down into an even greater number of responses. As such, most of the data reported here are indicative of attitudes and values across the entire group of participants, which can be meaningfully compared against data obtained from other sources (Statistics Canada, Ipsos/Google, and Placespeak). I do not press this baseline data on participants much further than on the question of generalizability of the sample.

However, there are three variables here that are potentially informative in terms of exploratory statistics, given that they cleave into two roughly equal groups across the sample, in each instance: gender, Facebook/Android grouping, and pre/post-app use responses. As noted previously, in the pre-app use group (n=33) there were 20 males and 13 females, while in the post-app use group (n=21) there were 11 males and 10 females. No users indicated the “other” category on the gender question. In light of this, I conduct a few comparisons between males and females based on their responses to

survey questions corresponding to the three main questions this research considers. I also look at differences between the FB group (10 post-app use) and the Android group (11 post-app use), as well as differences noted between pre-app use (n=33) and post-app use (n=21) surveys.

5.4. Results

Below, I review the demographic and self-reported media use profiles of the participants in this study. Then I compare the demographic and media use profiles of the participant pool with larger, more representative samples of the Metro Vancouver region, to illustrate how closely the sample represents the general population. I then report on the significant findings in the set of “values and attitudes” questions in the study: univariate data points that show a strong trend in one direction or another as they are attached to my primary research questions (for instance, whether a majority of users agree strongly with the idea that their privacy is vulnerable when they use their mobile phone, or not). Then I perform exploratory statistics to look for relationships between gender, Android/Facebook grouping, and pre-/post-app use and responses to the “values and attitudes” questions (which address privacy, surveillance, and city life). Finally, I examine participant feedback and commentary within the app to give my exploratory findings more substantive weight and concrete illustration.

5.4.2. Demographics

To obtain a better picture of to what degree the sample selected for this study is representative of the broader population in the Metro Vancouver area, baseline demographics obtained in the pre-app use survey are here compared alongside Statistics Canada figures for 2011, for the Vancouver Census Metropolitan Area (Appendix C, Tables 1-7). Demographic categories asked about in our survey were indexed to Statistics Canada categories and choice matrices.

Participants consisted of 17 (51%) male, and 16 (49%) female (no other gender identities claimed, though an “Other” category was available to select). This indicates that gender balance is in line with the overall population pattern.

Twenty-two (67%) participants indicated their marital status as “never married”, while eight (24%) indicated “married or common law”, and a further three (9%) indicated “divorced”. The marital status profile of the sample is not representative of the overall breakdown of marital status in the general population (which is 43% never married, 56 % married or common-law, 7.6% divorced, 2.8% separated, and 5% widowed).

Fourteen (42%) users recruited for this study were under the age of 25, and 25 (88%) were under the age of 45. The median age bracket was 25-34. Only four users were over the age of 45. The age range of study participants is not representative of the overall population pattern.

Seventeen (51%) users identified to be of Western European ethnic backgrounds, followed by seven (21%) people of Chinese backgrounds, three from Southeast Asian countries (Philippines/Thailand/Vietnam), two from South Asian countries (India/Pakistan/Sri Lanka), one East Asian (Japan/Korea/Taiwan), one Central/Eastern Europe, and two “Other”. 29 (87%) users report that English is the language spoken in their home, while a minority of four (12%) report this as Cantonese or Mandarin. This is somewhat different from the overall pattern observed in the population.

Fifteen (49%) users list their primary occupation as “Education, law, social/government/community services”, followed by four (12%) in “business finance and administration”, three (9%) in “nonprofit and community organizations”, and the remaining 11 distributed among other categories, with four (12%) in the “other” category. This is a different pattern than is present in the overall population. Income figures tracked roughly in step with figures for the overall population. Thirteen (39%) report an annual household income above \$80,000 per year. Eight participants (21%) report an income of under \$20,000 per year.. The median reported income level is above \$80,000 per year. Thirty (91%) users had completed some college or university. All users had completed high school. Thirteen (39%) users had completed a university degree, a much higher proportion than observed in the general population.

Generally speaking, the demographic group that participated in this study was gender balanced, but skewed toward high levels of education and affluence. It is a group that reflects a diversity profile that is more European-descended than is found in the general population of the Metro Vancouver region (Appendix C, Table 3), in which non-

European ethnic backgrounds are more prominently represented. The majority of participants were also more commonly employed in “Education, law, social/government/community services”, and were more commonly never married, young adults under the age of 45 (Appendix C, Table 1) than is the statistical average for Vancouver Census Metropolitan Area. Any generalizations about the data collected on this group must be qualified in these respects.

5.4.3. Media Use Patterns

Participants in the study were given a series of questions about their use of media technologies.

Of all 33 survey respondents, 27 use their personal computer “constantly” (meaning more than once per day), while six do so only daily. Twenty-nine use the internet constantly, three use it daily, and one uses it only about once per week. Twenty-three use email constantly, nine daily, and one uses it only several times per week. Fourteen respondents use instant messaging constantly, while six use it daily, seven frequently, two regularly, and three “never”. Nineteen respondents use “social networks/Facebook” constantly, while seven use these daily, six several times per week, and only one uses them rarely. Ten subjects never use “Twitter/microblog services”, seven use these constantly, five use them several times per week, four use them less than once a month, and two use them daily.

Respondents who write their own Blogs or Tumblr feeds are reported as follows: nineteen never, three constantly, seven rarely, and three about once per week. Twenty-eight respondents never use virtual/immersive worlds. One respondent uses them several times per week, while another respondent uses them once per week. Respondents are generally unacquainted with environments like MMORPGs: twenty-seven never use them, while two use these several times per week, and two more use them about once per week. Gaming consoles are infrequently used by this group, too (17 never, six less than once per month, seven about once per month, and only one uses them daily). Respondents report using video games (PC or console) as follows: thirteen (never), five (less than once per month) three (about once per month) four (once per week) four daily, and one “constantly”.

For conventional broadcast media use, the group tracks closely with patterns seen in the general population. TV use: ten watch several times per week, nine watch about once per week, two watch constantly, and five watch daily. Four respondents never watch TV. For radio, three listen constantly, ten daily, eight several times per week, four once per week, and a further five listen less than once per month.

For mobile phone use (not including smartphone use), twenty-three participants report “never”, while three report “constantly”. A majority of users (twenty) never use iPads or tablet computers, while six use them either daily (three) or constantly (three). A similar picture emerges for e-readers: twenty-three never, seven about once a week, and only two daily. Sixty-seven percent of users “rarely” or “never” conduct voice calls using a headset or headphones, while 33% do either sometimes (nine users) or most of the time (two users). On the exit survey, ten (of twenty-one) users report that they rarely (five) or never (five) do this, while six report that they do this sometimes, two report most of the time, and three report they do this all of the time. Eleven users wear headphones in cities “sometimes”, while eight wear them most of the time (seven) or all of the time (one), fourteen wear them either never (seven) or rarely (seven). On the Exit survey, six respondents report that they wear them sometimes, while two report most of the time, three all of the time, five never, and five rarely.

Overall, the surveyed group is more inclined to use digital and social media more extensively than the general population (precise comparisons to Statistics Canada data or Pew Internet data is not possible; only more general patterns may be compared). As of 2012, Statistics Canada reported that only 67% of Canadians used social networking sites, while the present sample shows a 93% rate (Statistics Canada, 2012).

5.4.4. Smartphone Use Profile

Compared to concurrent surveyed samples elsewhere (Google, 2013), the group of participants in this study was slightly less immersed in smartphone activities than observed in more representative samples.

Twenty-six users use their smartphone “constantly (several times per day)”. Two use their smartphone daily, while five never use a smartphone. Twenty-six (77%) of users have a data plan. Top ranked activities (most frequently used) on smartphones, in

order, include: texting (eleven), voice calls (nine), email (seven), and music listening (two). Second ranked smartphone activities included: voice calls (thirteen), texting (six), email (five), web browsing (five), task management (three), and social media (two). Their third ranked activities included social media (five), directions or maps (five), texting (four), email (four), web browsing (four), voice calls (two), and picture-taking (two).

The sample group's top ranked geolocation services were distributed as follows: "no answer" (five), Nextbus (seven) and directions or maps (sixteen). Their second ranked geolocation services were: "no answer" (nine), Nextbus (four), directions or maps (five), social media (four), and "finding nearby services" (three). Their third ranked geolocation services were: "no answer" (seventeen), "finding nearby services" (six), directions or maps (three), and social media (two).

For comparative purposes, the most granular data obtainable on smartphone use for general population in Canada (c. 2012) is found in a Google/Ipsos survey of 1000 Canadians' smartphone habits, conducted in 2013 (Google, 2013)²⁷. In this survey, 56% of Canadians had a smartphone (compared to 84% in the present study). According to Ipsos/Google, 89% of smartphone users look for local information using their phones, while in the present study, only a small number (nine of 33, or 27%) indicate doing this at all. While 55% of the Ipsos/Google respondents indicate that they use their phones for web browsing, only 33% of the group surveyed for the present study indicate this. Ipsos/Google figures also indicate a higher rate of mobile social network use (78%, versus 21% in the present study).

Overall, while the group surveyed for the present study was more digitally engaged than is indicated in the broader Canadian population, they were also less intensive with their use of smartphones for accessing the web, social networking, and location services generally. This suggests that location services and other data rich uses of smartphones were, for this group, a relatively new experience for a majority of them, generally speaking.

²⁷ The Ipsos research methodology and sample frame claims the following: "we interviewed a total of 1,000 Canadian online adults (18-64 years of age) who identified themselves as using a smartphone to access the Internet...The distribution is according to a national representative study and the data is weighted on age, gender, region, brand of smartphone, mobile internet usage frequency and tablet usage." (Google, 2013).

5.4.5. Transportation Habits

Compared with data available on Metro Vancouver transportation choices collected elsewhere (PlaceSpeak, 2013)²⁸, the group sampled for this study was more dependent on public transportation and non-carbon-intensive transit forms like cycling (Appendix C, Table 10). Note: not all situations surveyed in the present study are reflected in questions asked in external surveys.

For their “To work” commutes, twelve (36%) report that they primarily use transit, eleven (33%) primarily use an automobile, seven (21%) primarily cycle, while two (6%) primarily walk. This compares to region-wide figures of transit (38%), car (49%), bicycle (16%), and walking (17%)²⁹.

When commuting to school, the sample group breaks down as follows: fifteen (45%) primarily use transit, three (9%) primarily cycle, three (9%) primarily walk, while only two (6%) primarily use an automobile. Placespeak’s figures collapse work and school into a single category, so we may compare these with the aforementioned figures on “commuting to work or school” with some confidence as well.

For dining/shopping, seventeen use an automobile, eight use transit, while seven walk. For the wider population (Placespeak 2013), the figures are 80% car, 33% walking, 17% transit, and 9% cycle.

Given the low comparability of smartphone use patterns, the low comparability of transportation patterns, and noting how the demographic contours of the sample in the present study differ from the general population in Metro Vancouver, any generalizations based on the results may only be made with caution. This is a more public transit-using, more cycling-oriented, younger, less ethnically diverse, less smartphone savvy group than observed in the general population, compared to more representative survey results. However, on all other counts, insofar as is deducible from available data, the sample in the present study is a fairly accurate representation of the Metro Vancouver

28 PlaceSpeak’s sample frame included 1,407 households across the Metro Vancouver Regional District, stratified geographically, and via an online survey that included substantive geolocational verification processes (PlaceSpeak, 2013, pp. 14-16).

29 In PlaceSpeak’s survey, respondents could indicate more than one “primary” mode of transportation, unlike in the present study.

population, in terms of gender, education, affluence, and media use patterns overall. Further, the sample size is quite small (n=33), and so it is important that the quantitative data collected be compared with qualitative statements collected from participants as part of the exit survey, in order to better contextualize and give meaning to the survey results.

5.5. Findings: Gender, Mobility, and Effects of Participation

Examining the survey data for meaningful patterns, I am limiting my scope to a comparison of gender differences, differences pre- and post- app use, and differences between Android and Facebook groups, consistent with the central questions identified at the outset of this study. Using survey questions that correspond with these broader research questions, in the following section I explore observed relationships between (1) locative media use (that is, use of the app) and attitudes toward cities, (2) locative media use and privacy, and (3) locative media use and attitudes about public space. Given that participants were surveyed on these same questions twice (pre- and post-use of the Mobile GCC App), I can examine differences that could be indicative of how using geolocational media may affect these attitudes for the entire sample as a whole, within different gender groups, and between the Facebook and Android group.

5.5.2. Demographics (Gender)

(1) Are there any correlations between demographic characteristics and attitudes toward (a) privacy, (b) urban life or (c) sustainable choices?

The sample size limited the study's capacity to examine demographic variability on survey questions, with the exception of gender categories, which were approximately equally distributed in the sample. To address gendered differences, male and female-identified respondents were compared in terms of their responses to a series of questions covering each of these three topic areas. The comparison was performed pre- and post-app use. (For the "privacy" topic, Appendix A and B, Questions 25g, 25h, 25i, 25j, 25k, 25l were explored; for the "urban life" topic, Appendix A and B, Questions 25a,

25b, 25c, 25d, 25e, 25f were explored; while for “sustainable choices”, Appendix A and B, Questions 13, 14 and 15 were explored).

On almost all of these questions – from using headphones in public, to feeling isolated in public, to the degree to which individuals express feeling “free” in their city - very few differences were observed between males and females (pre- or post- app use). For instance, on the pre-survey question “I use headphones in public” no apparent gender differences were shown in the data (Figure 14).

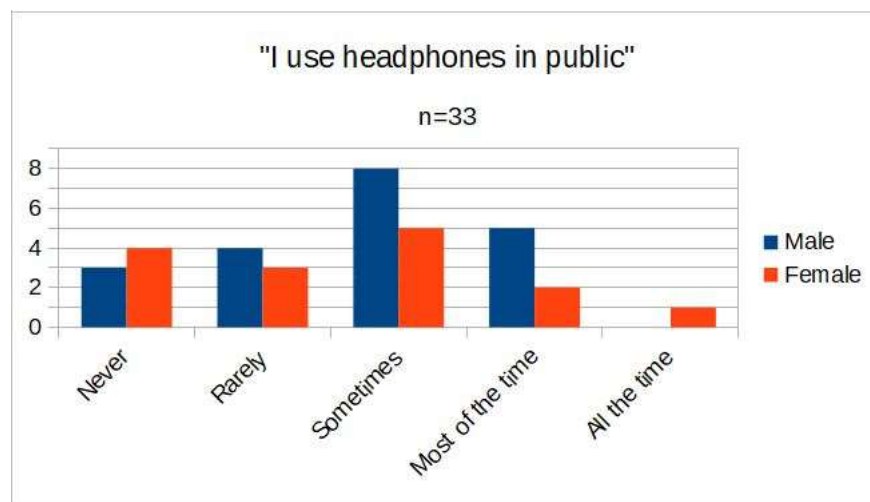


Figure 14: Responses, by gender, to the pre-app use survey prompt "I use headphones in public".

In most other questions grouped under this theme (pre- or post-survey), no notable differences were observed between gender groups. Only on one question were male and female responses distinctive (and then only after “Strongly Agree/Agree” and “Strongly Disagree/Disagree” response categories were collapsed). Males were more likely to disagree (fourteen) with the statement “I feel isolated in public”, with which females were more likely to feel neutral or agree (ten) (Figure 15).

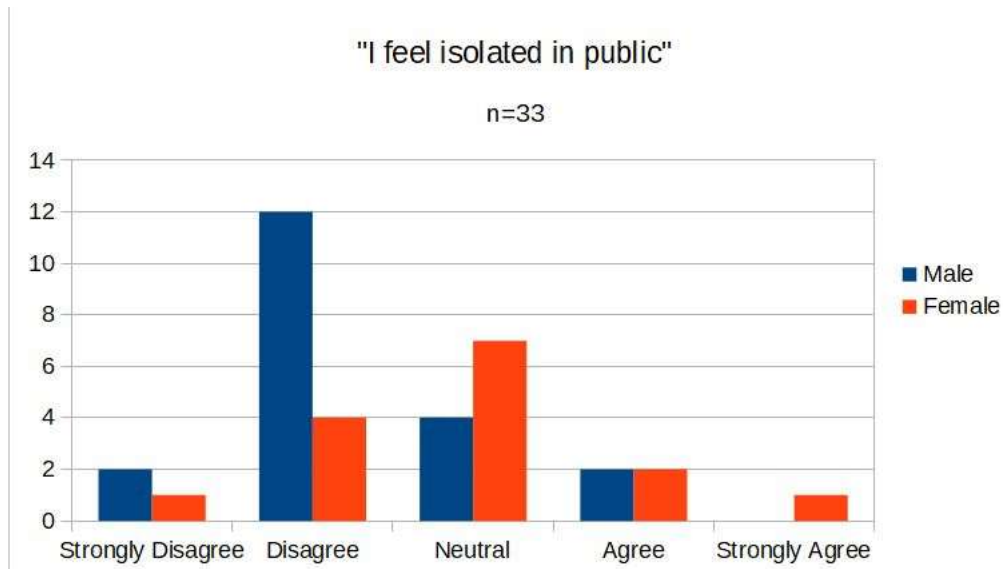


Figure 15: Responses, pre-app use, by gender, to the question: Indicate your agreement or disagreement with the statement "I feel isolated in public".

Therefore, the results of this survey suggest possible differences between males and females in terms of their attitudes toward locational privacy and urban life. There may well be *significant* differences between male and female attitudes toward these issues, but the present study did not demonstrate this.

5.5.3. Tracking vs non-tracking Effects

(2) Do users who know that their location is being constantly tracked express greater or lesser concern over their sense of locational privacy than individuals who are not geolocationally tracked?

For this question, users were divided into a control group (Facebook app, not tracked), and an experimental group (Android group, tracked), and their responses to several survey questions were compared (Appendix B, Questions 25g, 25h, 25i, 25j, 25k, 25l).

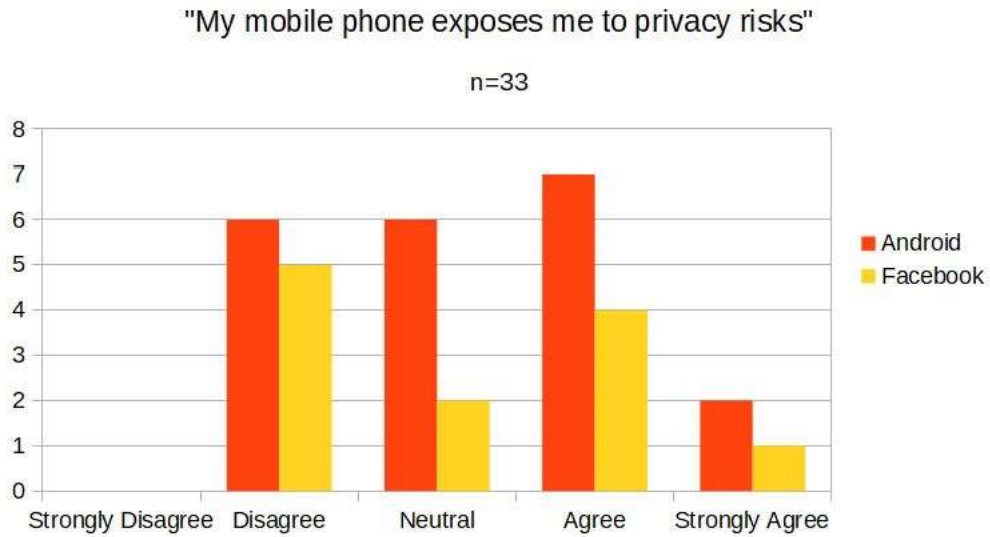


Figure 16: Responses, pre-app use, by platform, to the prompt "my mobile exposes me to privacy risks"

The distribution for responses to this question at the outset of the study was bipolar (eleven disagree, eight neutral, fourteen agree, as depicted in Figure 16). After the two week app use period, respondents who were locationally tracked 24/7 (Android group) differed from respondents who were not tracked (Facebook group). The non-tracked group was now more likely to agree that mobile phones expose them to privacy risks. The Android group, after being locationally tracked, has shifted in its perception of risk. After using the app, they were more likely to disagree with the statement that mobile phones expose them to privacy risks (Figure 17).

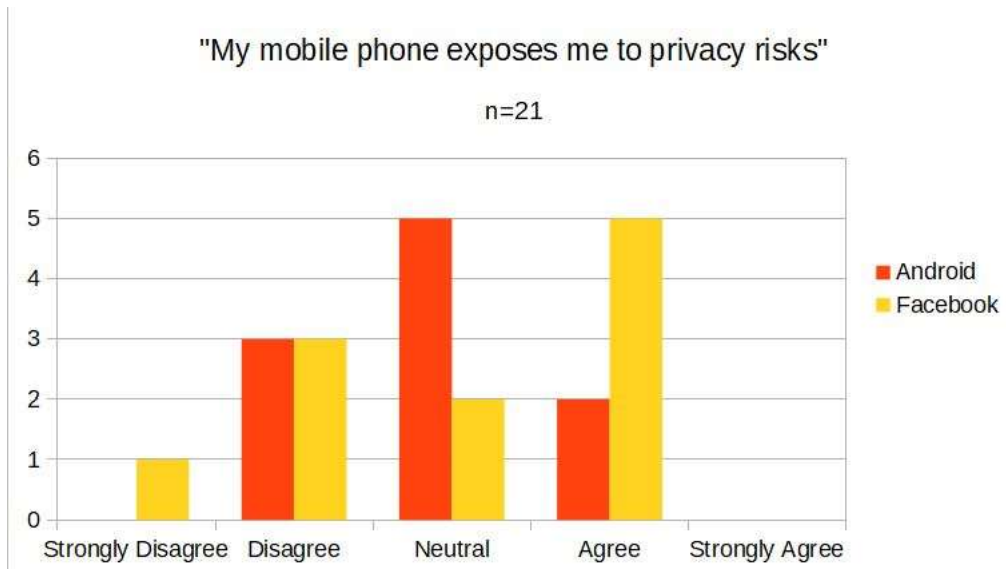


Figure 17: Responses, post-app use, by platform, to the prompt “my mobile exposes me to privacy risks”

There is still some concern that the differences observed here reflect not differences resulting from the awareness of being tracked but also from (1) differences between using the Facebook platform vs using the Android app or (2) differences between using a computer or a smartphone. The group is divided over whether or not phones expose them to privacy risks, but, as I examine below, it is also possible that those concerned about locational privacy were among the twelve respondents who dropped out before completing the study³⁰.

5.5.4. Findings: Pre- and post-app use

Respondents across the sample as a whole report some attitudinal differences after using the app for two weeks. On issues of sustainability, respondent attitudes are generally consistent before and after the study. On issues related to privacy and surveillance, results are varied (on some questions, there are notable differences, partly attributable to dropout effects, but in part possibly an effect of using the app).

³⁰ This would be a telling result in itself (but a result difficult to distinguish from other reasons users may have had for dropping out, such as possible undocumented errors in app usability design)

(3) Do users show any differences in their agreement with statements in favour of sustainable environmental choices after completing the study than before using the app?

For this question, all users pre-app use and post-app use were compared to look for significant changes in responses to questions about sustainable behaviours (Appendix A and 2, Questions 13, 14 and 15).

No notable differences were observed in users' responses to questions about sustainable behaviours. For instance, users were asked to put in ranked order the institutions and individuals they felt were most responsible for ensuring an environmentally sustainable society. With the possible exception of sentiments about the responsibility of civic governments (which declined, not due to dropout effects but, seemingly, due to real shifts correlated with the use of the app³¹), there were no significant changes between the pre-app survey and the post-app survey (Figure 18). With the exception of this shift in opinion about civic government, environmental attitudes were remarkably resilient to any change after the experience of using the app³².

31 There are a few possible interpretations for the shift in attitudes about civic governments (which I discuss in the Analysis section below)

32 For instance, as part of the cluster of questions about attitudes toward sustainability (mandated by the GCCP research group), respondents were asked to rank on a Likert-type scale their feelings about the importance of various collective actions, such as "limiting world population growth", "reducing greenhouse gases", "protecting wild animal and plant life" (etc.) on a scale ranging from "not very important" to "very important". Results were so consistent across all of these questions that no specific analysis is warranted for the purposes of the present discussion.

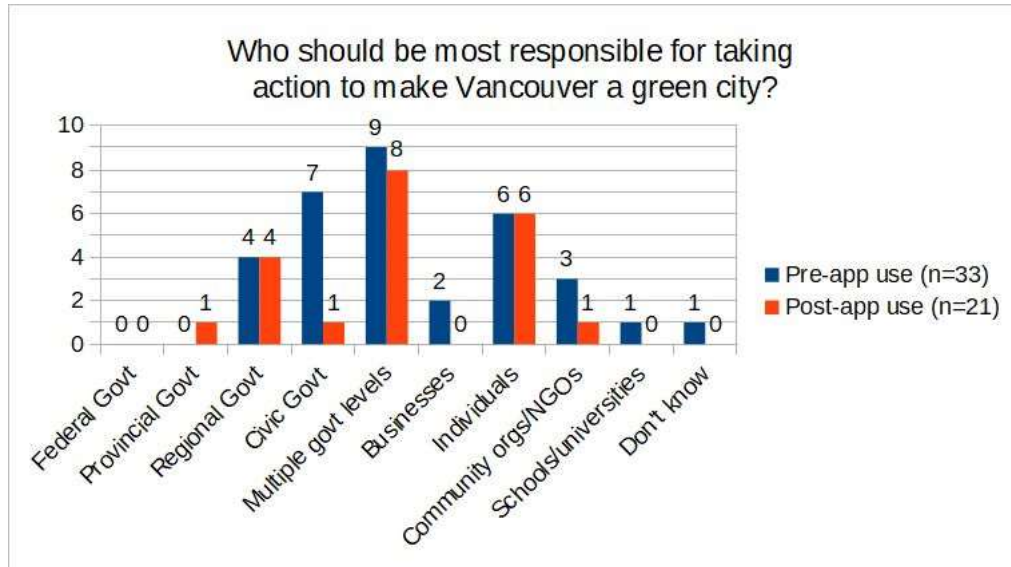


Figure 18: Subject responses, pre- and post-app use, to the prompt "Who should be most responsible for taking action to make Vancouver a green city?"

(4) Do users indicate any increase in their concerns about privacy after using the trip tracking app?

For this question, all users pre-app use and post-app use were compared to look for significant changes in responses to questions about privacy (Appendix A and B, Questions 25g, 25h, 25i, 25j, 25k, 25l).

For some of these questions, there were again no differences observed between pre-app use and post-app use responses. For instance, on the question "Indicate your agreement or disagreement with the following statement: 'If I'm not doing anything wrong, I shouldn't be worried about my privacy' ", respondents registered no change in their attitudes after completing the two week study (Figures 19 and 20).

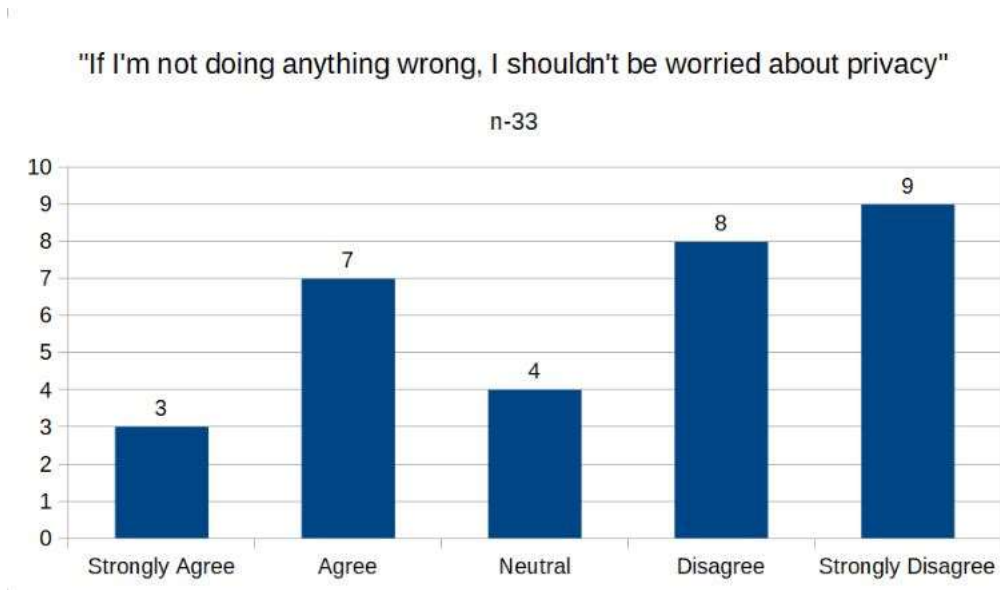


Figure 19: Pre-app use survey, Question 31: "Indicate your agreement or disagreement with the following statement: 'If I'm not doing anything wrong, I shouldn't be worried about my privacy' "

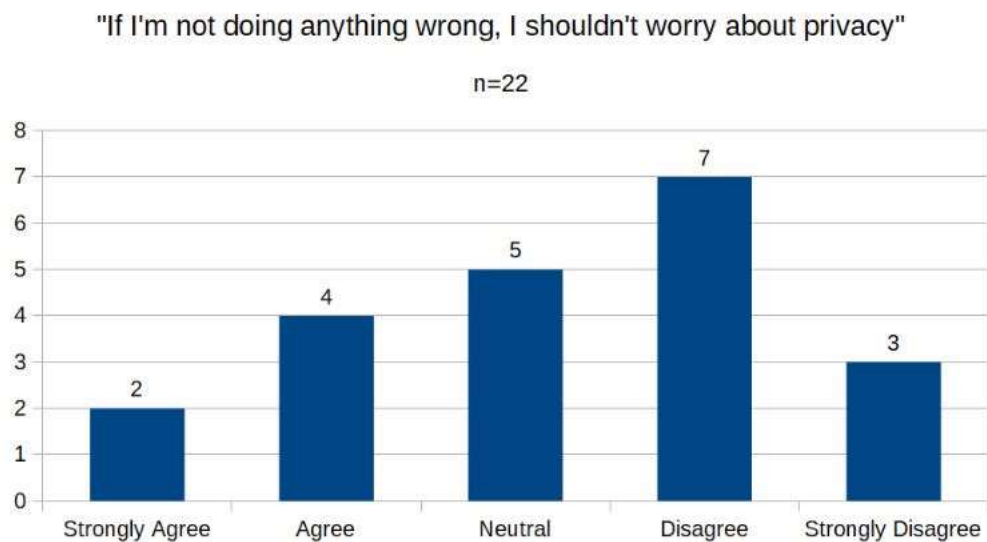


Figure 20: Post-app use survey, Question 8: "Indicate your agreement or disagreement with the following statement: 'If I'm not doing anything wrong, I shouldn't be worried about my privacy' "

On one question, there were notable differences (though these cannot be called *significant*): "Indicate your agreement or disagreement with the following statement: 'I

feel isolated in public' ". Before using the app, proportionally more users indicated a neutral stance toward this statement, while after using the app, the number of neutral responses diminished noticeably (Figures 21 and 22).

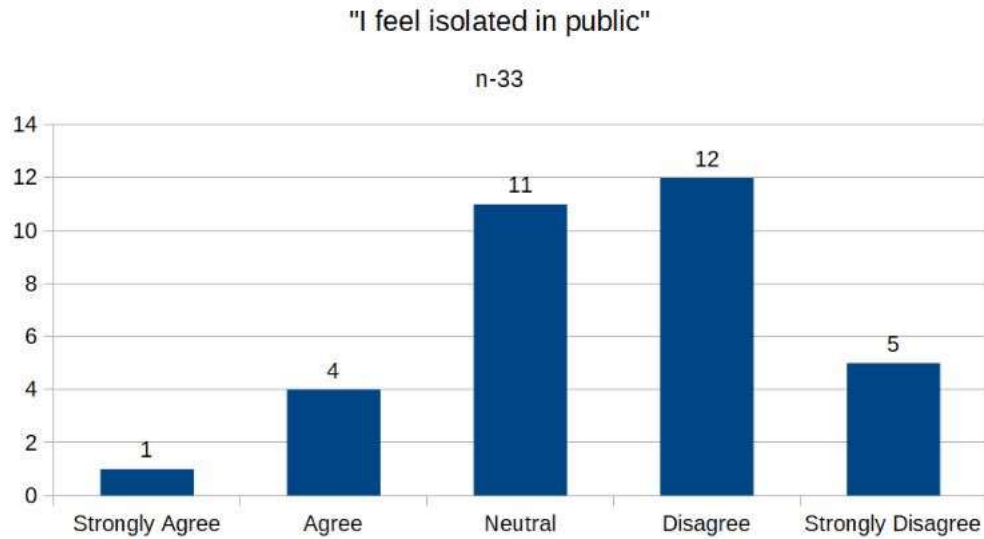


Figure 21: Pre-app use survey, Question 31: "Indicate your agreement or disagreement with the statement 'I feel isolated in public'"

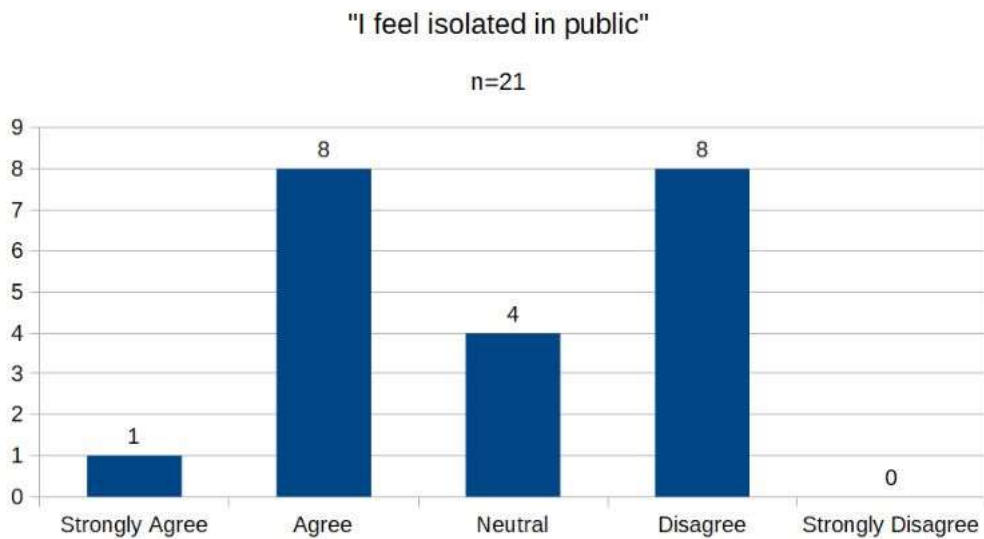


Figure 22: Post-app use survey, Question 8: "Indicate your agreement or disagreement with the statement 'I feel isolated in public' "

While this latter question is grouped loosely under the theme of “privacy questions”, it refers more specifically to notions of alienation or connectedness to community in an urban setting than to privacy *per se*. It would be premature to read too much into this question (given the small sample size and the relatively minor difference between the pre- and post-survey responses it represents).

5.5.5. Accounting for Dropout Effects

On some specific questions related to privacy and surveillance, however, differences pre- and post- were observed. However, to ascertain whether these differences are actually related to use of a geolocational app, dropout effects must be removed from the data under comparison.

One of the challenges with the research design for this study is the number of dropouts - research subjects who signed up for the study, completed an entrance survey, but did not complete the study. There were twelve (of 33) respondents who dropped out of the study before completing an exit survey, and their responses stood out from the rest of the group on the following questions.

Users who dropped out of the study before using the app were more likely to agree with the statement “I feel that things I do in public places should not be recorded with surveillance cameras” than the overall group of participants who answered the entrance survey. There is also a higher rate of agreement with this statement after respondents completed the study (Figure 23).

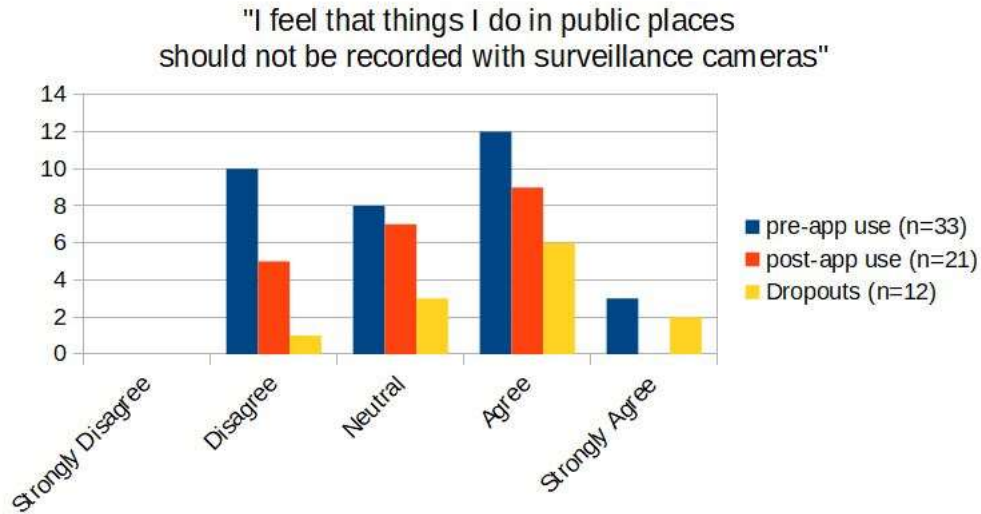


Figure 23: Subject responses (pre-, post, and dropout) to the prompt "I feel that things I do in public places should not be recorded with surveillance cameras"

Another pattern in the responses (to a related question) seems to confirm a general picture of dropout participants' values regarding surveillance cameras, but troubles the overall picture of possible effects of using a geolocational app on participants' attitudes toward surveillance. Users who dropped out of the study before using the app were more likely to disagree with the statement "surveillance cameras are generally good for society" than the overall group of entrance survey respondents (Figure 24). However, unlike with the previous question about surveillance, the removal of the dropouts seems to account for the shift in opinion represented in the exit survey responses. Participants were more likely to agree with the idea that surveillance cameras are good for society after completing the study than before completing the study. Perhaps individuals who are more wary of surveillance are less likely to commit to using a geolocation app, but the use of the app itself does not seem to cause any change in opinions about surveillance cameras *per se*.

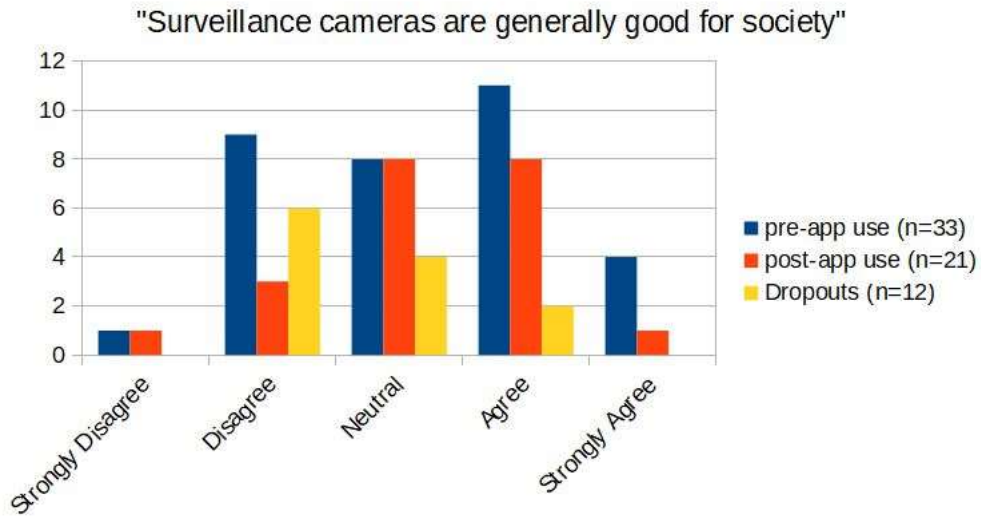


Figure 24: Subject responses (pre-, post, and dropout) to the prompt "Surveillance cameras are generally good for society"

Users who dropped out of the study before using the app were more likely to feel neutral or disagree with the statement "I feel that GPS and geolocation services are an invasion of privacy" (Figure 25). Therefore, the shift in opinions among those who completed the study may be due to use of the app. App users were more likely to agree with the statement after completing the study than before completing the study.

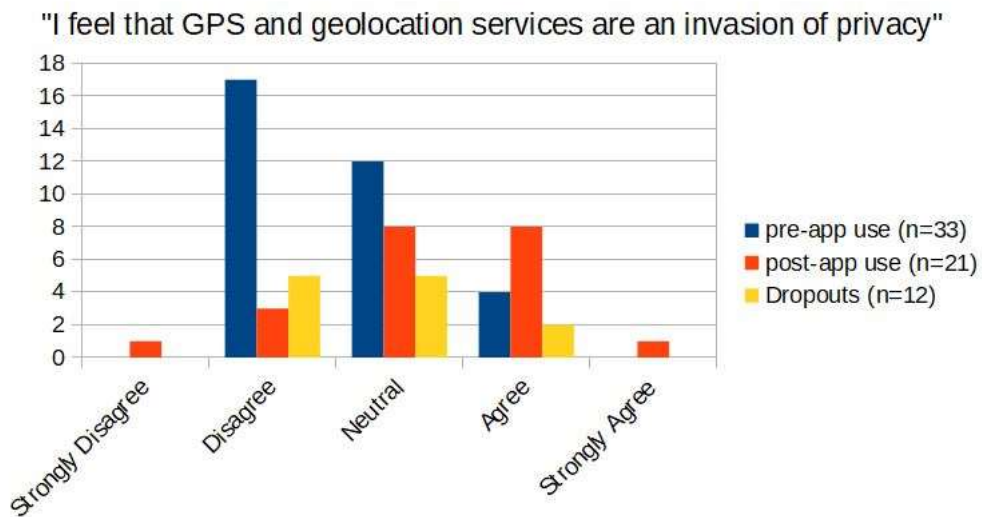


Figure 25: Subject responses (pre-, post, and dropout) to the prompt "I feel that GPS and geolocation services are an invasion of privacy"

Users who dropped out of the study before using the app were more likely to agree with the statement “I feel that the amount of public space is shrinking in my city” (Figure 26). There is a noticeable shift in the opinions of people who followed through with the study to completion. After the study, more respondents reported that they feel that public space is receding. Does receiving feedback about (and/or requiring respondents to contemplate) an individual’s movement in space lead to a perceptual shift on this question? Perhaps the data here are anomalous, but it is worth reflecting on this in light of subjective responses provided by study participants.

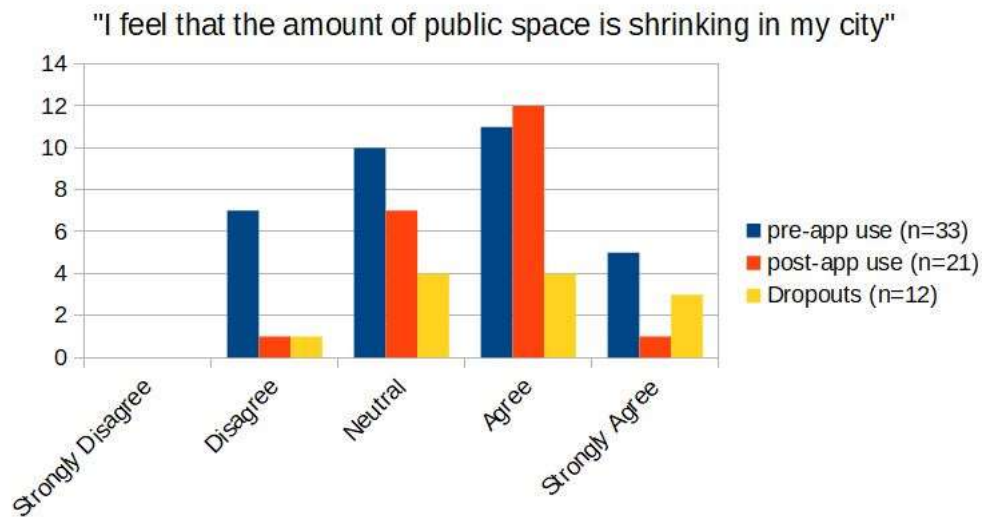


Figure 26: Subject responses (pre-, post, and dropout) to the prompt "I feel that the amount of public space is shrinking in my city"

5.5.6. Summary of Survey Results

Only one notable difference was observed between male and female users’ responses to the set of questions on privacy, urban life, and public space, and that was that males were more likely to disagree with the statement “I feel isolated in public” than were females. Otherwise, no differences between males and females were observed.

While users of the (tracked) Android app were more neutral toward the statement “My mobile phone exposes me to privacy risks” than were the (non-tracked) Facebook

app users, there were no other notable differences observed between these groups in terms of attitudes toward privacy, surveillance, urban life, or public space.

In terms of differences between the users before and after using the GCCP application, a few differences were observed. There was a decline in neutrality on the sentiment “I feel isolated in public”. Individuals who are more wary of surveillance are less likely to commit to using a geolocation app, but the use of the app itself has mixed effects upon opinions about surveillance cameras. Those who completed the study were more likely to agree with the statement “I feel that GPS and geolocation services are an invasion of privacy.” After completing the study, more respondents reported that they feel that public space is receding.

Given the above differences, it is probable that worries about privacy or surveillance adversely affected users’ decisions to participate in this study (at least in terms of dropping out after completing an informed consent form and preliminary survey). The responses post-app use, then, represent a group of participants who are more likely to approve of public surveillance technologies, including geolocational tracking. Yet, the experience of using the app is correlated with an increase in feelings of mistrust of geolocational apps. Notably, this was not more profoundly felt by the (tracked) Android group than by the (non-tracked) Facebook group. Respondents report greater appreciation for the recession of public space after completing the study (which required them to reflect upon their movements in urban space).

5.6. User Experience Feedback

To supplement this exploratory analysis of the survey results, I also analyze post-app use feedback collected from participants. This qualitative data enhances the observations about whether the app encourages sustainable behaviours, but, surprisingly, few research subjects discussed locational privacy at all, or expressed much concern over the subject. The user experience feedback reflects four main observations: (1) respondents have a keen appreciation for how well the app reflects the impact of individual actions, (2) the perceived utility and of the app as it was designed is questionable, (3) respondents have differing views about the app’s capacity for stimulating dialogue and/or community awareness with respect to sustainable practices, and (4) respondents reveal in their responses a strong sense of self identification as

environmentally conscious individuals, which is resistant to technical interventions like this app and others like it represents.

For the most part, users of the app reported that the app was effective in terms of educating them about their individual use of sustainable transportation and its actual impact. In particular, respondents noted that the visualizations were instrumental in augmenting their sense of impact that transportation has. One male subject reported that they “thought it was interesting to find out how far I and others traveled and by what mode of transportation and how this affected GHG emissions”, referring to the emissions tracking visualizations and leaderboard provided by the app. Other respondents mentioned this as well in connection with their thinking about sustainable transportation, with another male respondent indicating that “It really made me think about my transportation use, I made an effort to transit during the challenge.” A female respondent had a similar reaction, noting that her preconceptions about sustainable transportation were somewhat challenged by the feedback from the app: “I found that even taking a bus some places had the almost the same impact as a car because of the extra travel needed and that buses themselves had a larger impact than I thought”. Yet another participant (male) observed that the app “really gave me the opportunity to consider the impact of each time I chose a mode of transportation and encouraged me to think of walking and biking more”. Still one more male respondent noted that “I found out that I was leaving a bigger imprint than I thought and I found that it had me thinking about different ways of getting places that did not have as great of an impact (walking and biking)”. Overall, the sensory augmentation afforded by being able to visually track one's emissions was provocative and stimulating for subjects, who were, it is noteworthy, already self-identified environmentalists.

Perspectives were somewhat divided on the issue of whether the app was realistic in terms of its everyday usability. One male participant noted that the app was

“Interesting because people usually don't record their daily trips and don't really think about it much:, which inspired their “thinking about my daily trips and whether there is anything I can do to limit driving on a daily basis...(and as a result)... I intend to take public transit more in the summer (when the weather gets better).”

Another (female) participant emphasized this point even more strongly, stating that

“I'm already going way beyond levels of sustainability noted in this measure to the point that there was no real reflection on what my actual GGE's really were AND the app required a large investment of time in order to report all these wrong answers!”

So while some found the manual logging of trips counter-intuitive and in some cases, annoying, others saw value in the practice as a kind of reflexive exercise: “Monitoring myself was a healthy habit that helped with self-awareness. Then I can set a better plan with better goals that improve on what i have now”.

Respondents had even more divided views about the app’s capacity for stimulating dialogue and/or community awareness with respect to sustainable practices. One male participant indicated that while using the app, he “learned about other's points of views and could compare my transport and other stats to theirs, also found out how much each thing I did impacted the environment.”. A female user concurred, saying that the app “was informative for me because besides just keeping a log, there were some energy scores included in the challenges that helped us monitor ourselves (in comparison with others).” Another female respondent reported that “Since I was required to check it daily and input my travel information I was more conscious of my transportation decisions. Also, I could see I was not doing very well compared to others on the leaderboard”, which stimulated her eagerness to continue using the tracking app. Yet another male respondent echoed this sentiment, adding that it “was good to see other like-minded people participate... makes it seem like there might be hope for us after all!”

In contrast, some respondents report feeling that the app represents an ineffective approach to encouraging sustainable behaviours. One female respondent reported that “small things do help but there must more places and people that we can include, have to include to achieve any sort of reasonable goal”, in reference to the lack of dialogue she experienced within the context of the app. Another (male) respondent indicated somewhat starkly that “as a car-free vegan who doesn't take flights for pleasure and is committed to my local economy, my carbon footprint is already about as small as I can get it.” in response to this question, arguing, ostensibly, that meaningful

social change comes from ethical commitments (not technical accessibilities). Even more dramatic was the response of another (male) respondent, who pessimistically asserted that

“If this kind of app is the best a “greenest city initiative” can come up with, I’m now more convinced than ever that a sustainable future is hopeless. The only way this kind of thing could be helpful if it politicizes people and catalyzes a major movement to influence governments.”

Finally, respondents also reveal in their responses a strong sense of self-identification as environmentally conscious individuals. The app informs their self-perception as individuals who want to reduce their carbon footprint. Given that the user group already strongly identifies as environmentalists, then, the app becomes problematic if it is perceived as either inaccurate, or misleading in terms of how it purports to measure environmental impact. This is, for some, bound up in opinions about how meaningful environmental change can be achieved.

Related to this dissenting view, a few users reported challenges with the technical performance of the app. One male respondent reported that “it’s difficult using it everyday, you’re just not inclined to tap around on a phone and set a route for your transportation challenge. It’s not very interesting to those not who don’t care enough”, (echoing the pessimistic commentary about public dialogue above). Another (male) respondent indicated that he thought that “a modified version of the app would work well for a certain segment of the population - i.e. the younger population who are already somewhat engaged in sustainability and their community,” further reinforcing the view that the sense of one’s identity as an environmentalist stems from individual moral contemplation, which cannot be achieved through a mere technical affordance. Another respondent (also male) was apparently insulted by the greenhouse gas emission feedback the app provided, relating that “the information it presents is grossly inaccurate and best and utterly false at worse and everyone using it would know it. Why bother if you know the app isn’t giving you an accurate or fair indicator of the impacts your efforts are making.”

Again, some of the insights here point to different conceptions of effective environmental change, while others note the technical limitations of the app, which

points to possible inaccuracies with the information it collects and reports. The experience of using the app, for most users, seems to draw heavily on preexisting conceptions of sustainability, and the effectiveness of individual actions in creating change. So while the app functions in some ways as an effective “sensing” device, it also reflects back on (inscribes) and makes demands on participants’ identities as environmentally conscious individuals, often in ways that flow against the app’s design premise as an environmental awareness tool.

Overall, the qualitative data collected in post-app use interviews points to two findings that resonate with the observations of the survey data: (1) a broad consensus (with some dissent) that the app’s premise – to collect and report data on the impact of individual actions – is potentially beneficial and informative (the “sensory” in the sensory-inscribed), and (2) a clear tension over accuracy and meaningfulness as related to preexisting definitions of what effective environmentalism is (the “inscribed” part of sensory inscribed). There is also a strong imperative among participants to parse the app for its beneficial characteristics, and to criticize its limitations and adherence to possibly misleading models of effective change. In this sense, it is possible to examine participants’ impressions in terms of concretization.

5.7. Discussion

This user experience study indicates four important findings. First, there is some evidence of a gendered dimension to attitudes toward locational privacy and urban life. Second, users who knew that their location was being constantly tracked (the Android app group) indicated no greater concern over their locational privacy than did the group who were not geolocationally tracked (the Facebook app group). Third, while users in both app groups exhibited no significant increase in their agreement with statements in favour of sustainable environmental choices after completing the study, they report otherwise in post-survey interviews. Fourth, concerns about locational privacy and urban life change in varied ways after participating in the study, and some of these attitudinal changes appear to be correlated with the use of the app.

Users who were aware of being locationally tracked were not significantly different from their non-tracked peers, despite some subtle differences in their responses to some questions that hint at the possibility of nuanced differences between the groups.

The experience of using this location tracking (or logging) app seems to have not affected user sentiments about data sharing and privacy significantly; nor has it seemingly affected their inclination to engage in more sustainable behaviours (though users report differently on this in post- survey interviews).

Finally, the app was appreciated by participants for its sensory affordances, yet received some criticism for not reflecting or modeling preexisting beliefs about effective environmental change.

So do location tracking apps not raise privacy concerns generally, or was there something specific about the experience of using GCCP Mobile that mitigated this anticipated effect?

While this set of findings does not confirm the initial hypotheses (though this is a qualified confirmation, given the small sample of research participants [n=21] and possible self-selection bias in the recruitment), analysis of the data has produced several new questions for future research, primarily about the experience of wirelessly connected cities, ubiquitous sousveillance capabilities, and evolving conceptions of urban political power and empowerment.

Firstly, it is perhaps surprising that subjects recruited for this study are generally indifferent to the implications of locational tracking. The prospect for granular government or corporate location surveillance is a common concern voiced in today's popular and scholarly press; it is not an alien issue. For some reason, the participants recruited for this user experience study feel immune from those concerns. I speculate that the relative affluence of the sample (see Demographics, above) forms part of the reasoning here. Affluence is strongly associated with political power and agency. In my ethnographic study (Chapter Four), I noted that residence in poorer neighborhoods (like Vancouver's Downtown East Side) seems to bring with it a greater sensitivity to the threats to privacy posed by smartphone functionalities (cameraphones and location tracking both pose hazards to vulnerable people). A future line of inquiry might look at low income residents' perceptions and attitudes with respect to locative media and its implications for privacy, security, and safety.

Secondly, while gendered differences among the group studied as part of Mobile GCCP were not present in sharp relief in this study (With the one exception being the

question of feeling “isolated in public”, which women agreed with more than men), some very pronounced differences have been observed in the wider literature on mobile device use (Bull, 2004) and in my own ethnographic research (again, Chapter Four, wherein female participants gave voice to the ways in which their gender mattered with respect to the politics of locatability). The lack of strong confirmation for this observation in the present data is perplexing. The only possible reason I can articulate for it (besides sample error) is the relatively high level of educational attainment in the sample group, compared to the general population. Further research into gender and social class differences regarding mobile phone use in general, and locative media in particular, is clearly warranted, to arrive at a more nuanced understanding of some of these phenomena, given their presence in the ethnographic data and in other studies of mobile device use.

Finally, it is worthwhile to reflect on how study participants articulated strong opinions and criticisms of the app in light of the affordances of geolocational feedback, as well as their preexisting ideas about sustainability. Participants’ views on sustainability were strongly resistant to change as a result of using the app, consistent across all survey questions that touched on this theme. Participants also demonstrate a strong sense of identity as sustainability-minded individuals, with resilient definitions of sustainability and opinions about how change come about. On this dimension, app users can be observed to variously exploit the app’s sensory affordances or resist its inscribed inadequacies. In the next Chapter, I discuss these observations in terms of the framework of concretization.

Chapter 6. Conclusions

The present study examines the multifaceted and evolving world of location based media as a diverse and unpredictable field for the synthesis of a broad range of theories. In performing this synthesis I have arrived at a theory of locational literacy to systematically account for our engagements with interfaces and urban spaces as sites of knowledge generation, mutual constitution of self and place-based identities, and I have highlighted the potential for locational literacy as a program for political emancipation.

To recap, this work is situated within the emerging field of locative media studies (within mobile media studies), which, as discussed in Chapter One, has already developed a sophisticated analysis of how location structures digital and hybrid experiences according to logics of control and the idea of “net locality”. The notion of “sensory-inscribed” interfaces is particularly helpful in illuminating how locative media transform our relationships with spaces and other locatable individuals and institutions in unprecedented ways.

To better specify the political dimensions of our sensory-inscribed interface mediated experience (in Chapter Two) I develop a political theory of space and interfaces to outline potentialities and constraints in the current kinds of engagements human beings have with spaces and interfaces, using Lefebvre’s articulation of representational space and spaces of representation, and Feenberg’s theory of concretization of technology, respectively.

In my fieldwork (Chapter Four) I analyze how locative media users make sense of themselves, their devices and their surroundings in ways that reflect heavily on functions that augment and multiply their perceptions, experiences and perspectives (Lefebvre’s *spaces of representation*): primarily memory assistive functions, annotations of physical space using digital media, and affective attachments to particular places. I also examine how their political agency is amplified or constrained by circumstances that depend in part on technical limitations, but also on preexisting orders of political power. In this ethnographic context, locational literacy informs how these experiences can be articulated in ways that have politically emancipatory promise.

With the Mobile GCCP app user experience study, I attempted to identify how a group of sustainability minded and motivated app users come to envision their relationship with the urban environs of Metro Vancouver, and I examined their receptivity to the prospect of a mobile (or Facebook) application in enhancing their awareness of their own actions in space, along with the environmental implications of their actions. As discussed in Chapter Five, the results of this study were inconclusive in terms of ascertaining observable *effects* upon users (with respect to their awareness of being locationally tracked). However, given research subjects' post-participation commentary, the app experience is an informative case study of how interfaces and apps help reinforce how individuals conceive of themselves as "sustainability minded" subjects who share a commitment to bettering the world. In this sense, the app enables individuals to have a clearer understanding of themselves by reflecting their actions (and the environmental implications thereof) back to them in near-real time.

I have argued that "locational literacy" can be mobilized as a primary locus for renegotiations of power, uses of space, and the variety of sensibilities brought to bear upon hybrid digital-physical space. This makes it possible to comprehend with better granularity the complex nature of our subjection to strategic projects, and our possibilities for resistance to such programs as they are structured by space and in established spatial relationships. By operationalizing democratic rationalizations as a project for better understanding the nuanced character of our micro-level engagements with interface technologies, we are better equipped to mobilize locational literacy in the environments in which we find ourselves.

In my ethnographic research, I made a few observations that inform this argument. The way we give space meaning by ascribing it placehood varies based on our dominant mode of transportation, our subject position (race, gender, and class, predominantly), our length of tenure in a space, and our degree and kind of use of mobile capture devices like cameraphones. This corresponds to the "sensory" dimension of mobile interfaces as "sensory inscribed". In this way, modes of transportation and mobile interfaces both act as "sensing" devices in our "reading" of urban space. Mobile interfaces and transportation devices are also "inscribed" (in that they are used to display status or otherwise publicly demonstrate identities to others in our environment. Similarly, the memory-assistive capacities of mobile interfaces are as much "sensory" (augmenting our sense of the present with a greater horizon of memory, extending our

“sensing” into the past, in a sense) as they are “inscribed” (contributing to our sense of identity and facilitating historical narratives about our relationships with others). Also, the politics of who is allowed to film whom and in what place is bound to be an ongoing site of political contestation, and there is much resistance to the idea that institutional, state or corporate rule structures may be imposed on these kinds of practices (alongside the differences between people of different genders and social classes with respect to how political power and agency may be activated within the existing ideological order).

In the user experience study, I noted that subjects recruited for the trip-tracking app study were generally indifferent to the implications of locational tracking, seemingly feeling immune from these concerns. Perhaps this is due to the relative affluence – and preexisting sense of political empowerment - of the sample. Participants also demonstrated a strong sense of identity as sustainability-minded individuals, with resilient definitions of sustainability and opinions about how change come about. These app users clearly have a strong sense of agency with respect to variously exploiting the app’s sensory affordances or resisting its inscribed agenda.

When these parts of our everyday experience - transportation and mobile interfaces, memory assistive technologies, the political dimensions of using image capturing technology inconspicuously, and environmental identity and action as sensory-inscribed practices– are grafted onto Feenberg’s concretization, one can articulate the landscape of locational media literacy more clearly. Administrative agendas are imposed or reinforced through technologies via primary instrumentalizations, whether decontextualization (wherein individuals are enrolled as technical subjects, such as the operator of a motor vehicle within the technical system of traffic flow, the rules of the road, and the technical interaction of car and driver), reduction (whereby an individual, perhaps an automobile driver, puts the blinders on to anything outside the immediate strategic demands of negotiating traffic), autonomization (wherein technical designs prohibit agency, such as with the automatic deletion of archived messages or photographs in applications like Snapchat, which impairs memory-assistive capacities in order to impose an administrative ethos about user privacy through the app’s code), or through positioning (wherein individual actions are carried out in ways that reinforce administrative agendas hard-wired into codes and networks, such as when individuals submit cameraphone photographs or video of public protests that police wish to gather evidence on).

Additionally, the sensory-inscribed interface empowers individuals to enact their own agendas via secondary instrumentalizations, whether through systematization (where users make unanticipated uses of device functions, such as pooling geolocational data to document police violence), mediation (where there are ethically or politically motivated uses of interfaces, against their intended use paradigm, such as documenting political events as an independent journalist, despite being shoved aside by institutional media such as a CBC crew), vocation (where users are transformed by their interfacial actions, such as when they deliberately conceal their home locations by switching off trip-tracking apps tactically), or initiative (where users tactically resist technical controls, as with the hacking of urban spatial designs afforded by interfaces - like bicycles - that can resist road designs).

Have our concerns about locative media changed, since the advent of the mobile phone (or for that matter, the smartphone)? Where once we maintained an analytic difference between the domains of data privacy and the personal security and safety afforded by mobile phones, increasingly this is no longer the case. We no longer think about our locational privacy risks independently of the security affordances of phones, as even Rich Ling acknowledged early on in the history of mobile media studies (2004). Is this due to the technology's unique position as an actant in an articulated network of people and things (Latour 2004), namely its unique design as locatable and locating? Or is this a byproduct of shifting values and social norms that reach into the phone and draw out its locatable and locating features so as to amplify them?

The transformative effects of locative media play out on both macro- and micro-levels of practice. In fact, this seems to account for the source of some of the commonsense confusion about locative media that persists in the public imaginary. Security on the micro-scale refers to avoiding getting into accidents, and being able to contact others for help in case one does. Privacy on the micro-scale refers to our exposure to being stalked or harassed (*in personum* concerns). Privacy on the macro-scale crosses into the terrain of civil liberties as against the prying eyes of government and corporations, as well as the negative consequences of social sous-veillance (*in rem* concerns). Security on the macro-scale refers to our collective sense of security against hidden or unforeseen societal threats, such as terrorism, natural disasters, and so on.

The locative smartphone bundles these features and concerns together into a single handheld device and effectively bundles our conceptualization of these things as analytically distinct issues. The question becomes, at what point is this a political and social cost? McLuhan (1964) theorized that our use of media technologies comes to constitute an 'outering' of human senses. In this instance this might mean an extension of our fears of exposure and insulative practices we normally use to deal with this fear into our use of geolocational features (allowing ourselves to be mapped and tracked numbs our fears associated with so doing). The point is that we can become less adept at managing and standing up for privacy if we confuse it with security, and vice versa. If the mobile phone black boxes these analytically distinct concerns, then it is an obstacle to acknowledging that they exist. Concerns about privacy and security then become part of the technical environment (like DRM codes a default conception of intellectual property rights into the computer or iPod, and by extension into everyday society).

Better theorizations of space and technological design, such as I have reviewed here, help us to escape these dilemmas. Whatever default positions have been coded into the software and hardware of phones will have prevailing influence over societies, and various actors can effect the hard wiring of devices in this way, with effects that reach far beyond their intentions. For instance, George W Bush enacted in 2004 a law that compels mobile phone manufacturers to make all phones locative, in the interests of law enforcement and national security, against a post-9/11 political and ethical backdrop *vis a vis* fears about terrorism. Now, it is assumed that phones (not only smartphones) are locative devices, though this was a politically motivated legislative constraint imposed upon designers. The thing changed. But we (through the Bush government policy) changed it.

Recalling Benjamin's (1933) idea of "aura" we can add another layer to this: the *aura* of the original is that embodied, unique presence that cannot be simulated, only cut-up and sent everywhere at once. Benjamin seems to break from the pack in implying that mechanical reproduction is as liberating as it is disembodying. Simmel (1950) argues a similar point about cities: that the impersonal form of interaction liberates us from the tyrannies of neighbors and villages.

The alarmism over teens texting, distracted pedestrians, even the unknown dangers of electromagnetic fields emanating from wireless devices of whatever protocol

or bandwidth all stem from a similar, related fear of alienation (or disembodiment). We experience a similar discomfort in unfamiliar cities, with which we are (by definition, functionally) locationally illiterate. Locational literacy, if individuals are to achieve it, requires that we discard inaccurate notions of “embodiment” that preclude the “virtual” as “not real”. As Farman (2012) reminds us, the “virtual” is more about the possible rather than the “not real”. This implies a rethinking of Benjamin’s “aura” of authenticity as inclusive of our “virtual” or hybrid experiences in mediated urban spaces.

While ubiquitous urban mediaspheres promise to amplify some of these false dichotomies (between “real” and “not real”), they also can inspire, at the everyday level, new practices to cope and adapt to the changing environment. But there’s perhaps more to consider, moving forward. Consider the phantasms of place - the memories we leave behind us in places. When we revisit a place we once spent much time in, we easily recall events that do not spring to mind when in other places. The sensorium present and persistent in place is mutually constitutive to our experience, including memories of that experience. We grow attachment to places as they accumulate sediments of our experience and feeling.

Additionally, our commonsense views of and use of space are descended from conceptions about space created within an imperial, neocolonial condition. We have inherited from a colonial legacy a cultural predisposition toward mapping as an expression of and enactment of strategic power, and this provided an impetus for research and development of long distance communication technologies. The objectives of mercantilist states – shrinking space in order to have increasingly timely news about distant markets, crop conditions, and combat operations – composed threads of global flows of information that were the prototype for global capitalism. The flows of information in the early 21st century follow a similar pattern. The project of colonial cartography manifests most profoundly in applications like Google Maps. But the concern for Cartesian mapping and possessing of all space with mathematical granularity is only part of the story.

The world of smartphones and the 'internet of things' as has been developed (unevenly) in various affluent cities around the world provides a new field of data to examine our relationships with each other, with institutions, with objects, with interfaces, and with space. In the present ethnographic context of Vancouver, Canada (though this

could be applied to other jurisdictions, too), strategic concerns comprise many things – 3G and 4G networks, cell towers and infrastructure, commercial design of handsets, contractual agreements between wireless providers and their customers, and government policies and institutions that provide the legal (policies designed to protect the public interest, or the functioning of markets, as well as licensing patterns) and technical framework (spectrum allocation and innovations related to optimizing use of frequencies). Apps (and application environments such as the Apple App Store or Google Play Store) also feature *strategic*, rule-centered constraints (though as discussed below, to varying extents, and depending on their design, these also permit some of the world of tactics to operate, as well).

Tactics, on the other hand, are the ground that official discourses (of contracts, legal, commercial, and technical infrastructures) forget – the zone where human actors put their own desires and needs into action. This includes unanticipated uses of phones (as pop-up, ad hoc wi-fi sharing hotspots, for instance), or independent app development (the Google Android Play store is not very restrictive on allowing apps into its market, and Android phones are easily adaptable to allow for 'unofficial' apps to be installed). QR codes, which are instantly generated via free websites, allow citizens with no official role in the organization of the internet of things to participate in its buildout. Other practices such as geocaching, or apps like Wikitude or Layar (which enable individuals to annotate the urban environment with personalized data layers) offer further opportunities for users to hack their environs by layering user generated content into a virtual locational data layer that is publicly accessible.

But the adaptation of such techniques and applications to the realm of mobile devices is constrained by political economic factors. The open structure of the wired Internet, comprising a peer to peer structure based on the open standard of the TCP/IP protocol, creates opportunities for democratized communication that are not as easily nor fully realizable in networks utilizing different technical designs (such as networks designed for mobile telephony). While the open design of the wired web has allowed relatively democratic, peer-to-peer communications platforms to flourish, the wireless web is designed and regulated quite differently. When the wireless internet was still in a nascent phase of development, the opportunities for democratic communication once loomed large (Gow & Smith, 2006). But serious challenges remain, in part based on the

closed nature of wireless infrastructure, and its domination by a small number of loosely-regulated corporations who maintain an oligopoly on network access.

Against this backdrop of struggle, I have articulated a theory of locational literacy, premised on ideas from critical constructivism, in order to provide a foundation for moving forward, both in terms of coming to grips with the everyday realities of locative media, but also in terms of directions for future research inquiries. I outline these directions below, firstly with respect to how we might envision the way forward in terms of everyday practices and policy in our communities, and secondly within the context of scholarly research in locative media studies.

If we acknowledge the notion of how interfaces are “sensory-inscribed” (that is reading, and simultaneously, writing interfaces) that mediate our relationships, perceptions of our environments, memories, and political realities in complex, yet graspable, patterned ways, then we can more knowledgeably, as individual locative media users, renegotiate the terms of reference for our interactions with those interfaces. What is more: because our relationship to locative media interfaces is so intimate in nature, and because those interfaces extend our capabilities into the built environment as well as the world of human interpersonal communication on an everyday level, our consciousness of these interfaces as sensory-inscribed can empower us in these public contexts, as well.

Locational literacy, in this respect, may be conceived as a project of consciousness raising with respect to our relationship toward both mobile, locative technologies as well as the global, digital infrastructures to which those interfaces are connected. The theoretical framing of critical constructivism, and in particular an analysis of these everyday interactions in terms of primary and secondary instrumentalizations, enables us to refine this sense of awareness or literacy. Concretization gives us a vocabulary for recognizing and articulating opportunities for individual or group actions that uphold or upend architectures of control. Similarly, locational literacy as I have formulated it has opened up opportunities for re-thinking about the mediated relationship to place we already have.

Locational literacy can also be conceived as part of a broader digital literacies public education effort. If it is possible to realize more granular understanding of our

interactions with technical devices, interfaces, and urban infrastructures in our individual technical mediations, then it is also possible to articulate a program of locational literacy development within existing matrices of digital media literacies more broadly. While it is not the object in the present study to flesh out the particularities of such an ambitious project, the light I have shed on the issue in this thesis should demonstrate at minimum what a locational literacy program - also implicitly a program of political activism - might require: inculcating greater awareness of the implications of our sensory-inscribed instrumentalizations, greater transparency in interface design required of manufacturers and software companies, and more exposure to technical know-how in the general population, beyond the limited audience groups of early adopters and hackers.

This is not to say that such a program would be without challenges. For instance, the tension between official knowledge structures (i.e., surveillance cameras) and vernacular knowledge (i.e., personal locational data) will still be an ever present challenge (e.g., the trust my app study participants showed for surveillance cams, but the mistrust shown for newer, less visible/well-known forms of tracking like geolocational apps, is an intriguing finding here). But opening up the black box of locative and locating interfaces and software is an essential part of maintaining meaningful relationships to places we inhabit, and the other individuals with whom we interact in them.

In cities like Vancouver and Toronto (like many other globally interconnected cities), where it often feels as though the freight train of capitalism, gentrification, and rapid urban renewal are done not in the interests of city residents, becoming connected to and knowledgeable about places and databases alike is perhaps more important than ever before.

6.1. Recommendations for future research

In terms of future directions for scholarly research, a few related questions come to mind. On a simplistic level, we might consider investigating how to measure locational literacy. Knowing that locational literacy comprises (as I have uncovered) a broad range of strategic understandings, technical know-how, attentiveness to environments, and awareness of the perceptual limitations of different modalities of interacting with an environment and other people, how might we enumerate, categorize, and describe systematically what locational literacy is (and even if we could, would we want to do so,

or be required to do so by some program for change)? Certainly the contours of such a project are conceivable, and much is suggested about how that project might proceed, based on the way primary and secondary instrumentalizations can be realized in everyday practices.

A related line of inquiry relates to the relationship of memory, place and mental well-being. Some of this work is already being explored. Google Streetview is already being used as a form of experimental cognitive therapy for Alzheimer's patients in Oshawa, in which patients experience important places from their life histories virtually (using Streetview and the Bikearound, a stationary bike), which spurs memories, and, it is suggested by this initiative, therapeutic outcomes (Simmons, 2018). This suggests latent, hidden locational literacies that can be tapped (resembling some of the untapped literacies uncovered in my ethnographic research, and the greater attention given to public space by app users in my locative app user experience study).

Another future direction for research centers around the relationship of community well being and locational literacy. How can communities make use of sensory inscribed interfaces to map community resources and build alternative logics of place that are resistant to top-down imposed changes (like gentrification or capitalism)?

A final source of future research has already been suggested, regarding pragmatic applications of locational literacy. What would public education regarding locational literacy look like? How would it interleave (or not) with digital literacies more broadly? How much of locational literacy education would be formalized? How much would be standardized? How much would be improvised?

What unfolds depends largely on how individuals and groups adopt mobile phones, and the meanings that they ascribe to them in the process of doing so. But this happens against a backdrop of a slow-changing corporate landscape of corporations who regulate access. At the horizon of this changing technological landscape, indeterminacy exists, but politically mobilized notions of locational literacy can help provide a foundation for understanding – and perhaps overcoming – this uncertain state of affairs.

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Appendix A. Mobile GCCP Entrance Survey

So that we can get to know you a bit better, and make sure that the diversity of Vancouver is participating in this event, please tell us a bit about yourself in this short survey.

1. What is your home postal code?

2. What is your gender?

Male

Female

Other

3. How old are you?

Under 18

18-24

25-34

35-44

45-54

55-64

65-74

75 or Above

Prefer Not to Answer

3a. What is your Martial Status?

- Never married/Single
- Married
- Divorced
- Separated
- Widowed

4a. Which one of the following groups do you think is the most responsible for taking action to make Vancouver a green city?

- Individuals
- Businesses
- Community and non-profit organizations
- Schools and universities
- The City of Vancouver
- Metro Vancouver (regional authority)
- Provincial government
- Federal government
- Combination of government levels
- Don't know

4b. Which would be the 2nd most responsible?

- Individuals
- Businesses
- Community and non-profit organizations
- Schools and universities
- The City of Vancouver
- Metro Vancouver (regional authority)
- Provincial government
- Federal government
- Combination of government levels
- Don't know

5. The following ideas are sometimes used to define "sustainability". Please rate each idea in terms of how important it is to your views on sustainability, from (1) Not important at all, to (7) Very important.

a. Protect wild plants and animals from human impact

b. Reduce pollution and greenhouse gas emissions

c. Limit world population growth

d.Promote physical and mental health

e.Eliminate poverty

f.Safeguard civil rights and promote equality

g.Foster cultural expression

h.Pursue economic growth

i.Ensure adequate standard of living for all people

j.Invigorate green technological innovation

6. What is your main ethnic background?

Northern and Western European (e.g. Britain, Germany, France)

Central and Eastern European (e.g. Russia, Romania, Poland)

Southern European (e.g. Italy, Spain, Greece)

Chinese

East Asian, non-China (e.g. Japan, Korea, Taiwan)

South Asian (e.g. India, Pakistan, Sri Lanka)

- Southeast Asian (e.g. Philippines, Thailand, Vietnam)
- Aboriginal (e.g. First Nations, Inuit, Métis)
- Central and South American (e.g. Nicaragua, Mexico, Brazil)
- North Africa (e.g. Algeria, Morocco, Sudan)
- Sub-Saharan Africa (e.g. Kenya, South Africa, Congo)
- Middle East (e.g. Iran, Egypt, Turkey)
- Caribbean (e.g. Jamaica, Haiti, Cuba)
- Other

7. What language do you speak most often at home?

- Arabic
- Cambodian
- Chinese (Cantonese, Mandarin)
- English
- Farsi
- French
- German
- Greek
- Hindi
- Italian
- Persian (Farsi)

- Polish
- Portuguese
- Punjabi
- Russian
- Spanish
- Tagalog
- Urdu
- Vietnamese
- Other

8. What is your profession?

- Art and Culture
- Business, Finance and Administration
- Domestic and Family Care
- Health
- Education
- Government
- Management
- Manufacturing
- Natural and Applied Sciences
- Natural Resources

- Non-profit and Community Organization
- Recreation and Sport
- Religion
- Sales
- Student
- Social Services
- Trades, Construction, Equipment Operator
- Transportation
- Other
- Not employed

9. What is your household income?

- a. under \$20000
- b. \$20,000 - \$34,999
- c. \$35,000 - \$49,999
- d. \$50,000 - \$64,999
- e. \$65,000 - \$79,999
- f. above \$80000
- g. prefer not to say

10. What is the highest level of education you have completed?

- Part of elementary school
- Completed elementary school
- Part of high school
- Completed high school
- Some college or university
- Received a college or technical school certificate
- Received a university bachelor's degree
- Some postgraduate training
- Received a postgraduate university degree

11. Have you participated in other GCCP activities?

- a. no
- b. visited the website
- c. joined the FB group
- d. attended an arts event
- e. participated in a workshop

12. Please indicate the most common way you travel for each purpose.

Primarily Walk

Primarily Cycle

Primarily Transit

Primarily Auto
(Passenger)

Primarily Auto (Driver)

- a. Work
- b. School
- c. Personal Business
- d. Recreation / Social
- e. Picking up or dropping off friends or family
- f. Dining / Shopping

13. In the past 12 months have you... (please check all that apply):

- Thought about a sustainability issue
- Talked to friends, family or colleagues about a sustainability issue
- Signed a petition regarding a sustainability issue
- Donated money to an organization or group working on a sustainability issue
- Boycotted or deliberately bought certain products for sustainability reasons
- Changed your transportation choices for sustainability reasons
- Made other sustainability choices in your personal life
- Contacted a politician or a local government official about a sustainability issue
- Took part in a demonstration or protest on a sustainability issue

- Volunteered to work on a community project related to a sustainability issue

14. Please indicate whether you strongly agree, somewhat agree, unsure, somewhat disagree or strongly disagree with the following statements:

- a. Creating a sustainable society is the most important challenge we face today.
- b. I'm not sure how we can create a sustainable society.
- c. Creating a sustainable society is beyond our collective abilities.
- d. Most people don't care about creating a sustainable society.
- e. I can make a major contribution to achieving a sustainable society.

15. How would you rate your current understanding of the following issues (on the provided scale from 1-7)?

- a. The way choices made about land-use (location and density of buildings and amenities) affect transportation (road allocation and designation of certain roads as high-capacity arteries)?
- b. The way choices made about energy (the kind of energy we produce and the location of energy facilities) affect transportation?

c. The way choices made about transportation, land-use and energy will affect your quality of life?

d. The way choices made about transportation, land-use and energy will affect others' quality of life?

e. The way choices made about transportation, land-use and energy will affect greenhouse gas emissions (GHGs)?

f. The way choices made about transportation, land-use and energy will affect your cost of living?

Rank your use of the following communication media. For questions 16 and 17, you will be using this scale to rate how often you use certain media and technologies:

1 – Never (You have never used this type of device or service before)

2 – Rarely (You have used this type of device or service once or twice, but not with any regularity)

3 – Occasionally (You use this device or service, but no more than once a month)

4 – Regularly (You use this type of device or service for specific tasks, no more than once a week)

5 – Frequently (You use this device or service several times a week)

6 – Very Frequently (You use this device or service at least once a day, most days)

7 – Constantly (You use this device or service multiple times a day, every day.)

16. Rate how often you use the following technologies (for any task):

a. Smart Phone

b. Tablet PC:

c. E-Book Reader:

d. Home Gaming Console:

e. Personal Computer:

f. Other technology:

Describe: _____

17. Rate how often you use the following media or services:

a. Television

b. Radio

c. Twitter

d. Social Networks

e. Virtual/Immersive Worlds

f. Digital Games

g. Internet (web browsing)

h. E-mail

i. Texting

j. Blog

18. How did you find out about this activity or event?

- a. an organization
- b. friends
- c. the City of Vancouver
- d. through another GCCP activity
- e. ad
- f. other (specify)

19. Do you own your own mobile phone? Y/N

- a. If yes, do you pay the bill for it? Y/N
- b. If you answered "No" here, who does pay your phone bill? Y/N
- c. I have a data plan on my phone (Y/N)

20. Check off all the activities/functions that you use with your mobile device(s):

- browsing the web
- playing games
- sending/receiving SMS/text messages

- sending/receiving email
- voice calls
- accessing voice mail
- taking pictures
- sending pictures to other mobile phones (MMS)
- posting pictures to online profiles/sites (e.g., Facebook, Flickr)
- watching videos/movies
- listening to music
- making voice recordings
- making music
- posting status updates
- using Twitter or similar services
- taking notes
- 'checking in' to locations
- maps (directions, navigation)
- other (specify)_____

21. Of all of the things you checked off in Question 20, rank-order the top five things you do with your mobile phone in terms of how important they are to you, with the rank of "1" being the most important

1 _____

2 _____

3 _____

4 _____

5 _____

22. Check off all the locative services/functions that you use with your mobile device(s).

'checking in' to locations (e.g., Foursquare, Facebook Places)

getting directions (e.g., from Google Maps)

finding out when the next bus is coming

finding out about places nearby (e.g., using a location aware city guide, or Google Maps)

taking pictures or video that include geolocation data

uploading media to the web that includes geolocation data (to Youtube, Flickr, etc)

interacting with services that are fixed in space

logging my exercise (running, cycling)

logging my commute (cycling, driving, walking)

logging my movements (for any other reason)

checking out QR codes

augmented reality (AR) games

other location-based games

__ using civic "311" services (to report a pothole, graffiti, pollution, etc.)

__ bluetooth data exchange

__ syncing data with a computer

__ other (specify)_____

23. Of all of the things you checked off in Question 22, rank-order the top five things you do with your mobile phone in terms of how important they are to you, with the rank of "1" being the most important

1 _____

2 _____

3 _____

4 _____

5 _____

24. The greatest threat to privacy is (rank order the following)

_government

_corporations

_individuals (stalkers, etc.)

_the public (everyone has cameraphones nowadays)

_surveillance cameras

_software companies

_other (specify) _____

25. Answer how strongly you agree with the following statements:

a. When I walk around in a city, I usually wear headphones

- Never
- Rarely
- Sometimes
- Most of the time
- All the time

b. I conduct voice calls using a headset or headphones.

c. I feel isolated in public.

- Strongly disagree
- Somewhat disagree
- Unsure
- Somewhat agree
- Strongly Agree

- d. I find urban spaces noisy, and I use music over headphones to help me block it out.
- e. I feel free in a city.
- f. I feel free on the internet.
- g. I feel like using my mobile phone exposes me to privacy risks.
- h. If I'm not doing anything wrong, I shouldn't be worried about my privacy.
- i. I feel have a right to have information about me that is available on the internet removed if I don't like it.
- j. I feel that things I do in public places should not be recorded with surveillance cameras.
- k. Surveillance cameras are generally good for society.
- l. I feel that GPS and geolocation services are an invasion of privacy.
- m. I feel that GPS and geolocation services are very helpful.
- n. I feel that I have a right to use public spaces in my city.
- o. I feel that the amount of public space is shrinking in my city.
- p. Graffiti is generally a bad thing.
- q. Billboard advertising should be restricted in cities.
- r. There should be more public screens in cities than there currently are.
- s. I feel like my privacy has been invaded when a stranger takes my picture in public.
- t. I have a right to withhold permission for using images of me.
- u. When I use my smartphone in public I am better informed about my surroundings.
- v. When I use my smartphone in public I get distracted from my surroundings.
- w. When others use their phones in public they are usually distracted from what's going on around them.

x.Using phones in lineups is rude.

y.I have used my phone to avoid talking to people in public.

z.Sometimes I wear headphones in public when I am not listening to music (or other audio).

aa.Applications like Google Maps are indispensable.

bb.Applications like Google Streetview are indispensable.

Appendix B. Mobile GCCP Exit Survey

1a. Which one of the following groups do you think is the most responsible for taking action to make Vancouver a green city?

- Individuals
- Businesses
- Community and non-profit organizations
- Schools and universities
- The City of Vancouver
- Metro Vancouver (regional authority)
- Provincial government
- Federal government
- Combination of government levels
- Don't know

1b. Which would be the 2nd most responsible?

- Individuals
- Businesses
- Community and non-profit organizations
- Schools and universities
- The City of Vancouver
- Metro Vancouver (regional authority)

- Provincial government
- Federal government
- Combination of government levels
- Don't know

2. The following ideas are sometimes used to define "sustainability". Please rate each idea in terms of how important it is to your views on sustainability, from (1) Not important at all, to (7) Very important.

a. Protect wild plants and animals from human impact

b. Reduce pollution and greenhouse gas emissions

c. Limit world population growth

d. Promote physical and mental health

e. Eliminate poverty

f. Safeguard civil rights and promote equality

g. Foster cultural expression

h.Pursue economic growth

i.Ensure adequate standard of living for all people

j.Invigorate green technological innovation

3. Please indicate whether you strongly agree, somewhat agree, unsure, somewhat disagree or strongly disagree with the following statements:

a. Creating a sustainable society is the most important challenge we face today.

b. I'm not sure how we can create a sustainable society.

c. Creating a sustainable society is beyond our collective abilities.

d. Most people don't care about creating a sustainable society.

e. I can make a major contribution to achieving a sustainable society.

4. How would you rate your current understanding of the following issues (on the provided scale from 1-7)?

a. The way choices made about land-use (location and density of buildings and amenities) affect transportation (road allocation and designation of certain roads as high-capacity arteries)?

b. The way choices made about energy (the kind of energy we produce and the location of energy facilities) affect transportation?

c. The way choices made about transportation, land-use and energy will affect your quality of life?

d. The way choices made about transportation, land-use and energy will affect others' quality of life?

e. The way choices made about transportation, land-use and energy will affect greenhouse gas emissions (GHGs)?

f. The way choices made about transportation, land-use and energy will affect your cost of living?

5. The greatest threat to privacy is (rank order the following)

_government

_corporations

_individuals (stalkers, etc.)

_the public (everyone has cameraphones nowadays)

_surveillance cameras

_software companies

_other (specify) _____

6. Answer how strongly you agree with the following statements:

a. When I walk around in a city, I usually wear headphones

- Never
- Rarely
- Sometimes
- Most of the time
- All the time

b. I conduct voice calls using a headset or headphones.

c. I feel isolated in public.

- Strongly disagree
- Somewhat disagree
- Unsure
- Somewhat agree
- Strongly Agree

- d.I find urban spaces noisy, and I use music over headphones to help me block it out.
- e.I feel free in a city.
- f.I feel free on the internet.
- g.I feel like using my mobile phone exposes me to privacy risks.
- h.If I'm not doing anything wrong, I shouldn't be worried about my privacy.
- i.I feel have a right to have information about me that is available on the internet removed if I don't like it.
- j.I feel that things I do in public places should not be recorded with surveillance cameras.
- k.Surveillance cameras are generally good for society.
- l.I feel that GPS and geolocation services are an invasion of privacy.
- m.I feel that GPS and geolocation services are very helpful.
- n.I feel that I have a right to use public spaces in my city.
- o.I feel that the amount of public space is shrinking in my city.
- p.Graffiti is generally a bad thing.
- q.Billboard advertising should be restricted in cities.
- r.There should be more public screens in cities than there currently are.
- s.I feel like my privacy has been invaded when a stranger takes my picture in public.
- t.I have a right to withhold permission for using images of me.
- u.When I use my smartphone in public I am better informed about my surroundings.
- v.When I use my smartphone in public I get distracted from my surroundings.

w. When others use their phones in public they are usually distracted from what's going on around them.

x. Using phones in lineups is rude.

y. I have used my phone to avoid talking to people in public.

z. Sometimes I wear headphones in public when I am not listening to music (or other audio).

aa. Applications like Google Maps are indispensable.

bb. Applications like Google Streetview are indispensable.

7. I have used Google Streetview to _____ (open ended)

8. I have used Foursquare to _____ (open ended)

Answer the following questions about your experience using [INSERT APP NAME HERE]

9. I found the experience to be informative about:

a. the city's Greenest city goals

- Strongly disagree
- Somewhat disagree
- Unsure
- Somewhat agree
- Strongly Agree

b.my own behaviour related to sustainability

c.others' behaviour related to sustainability

d.others' opinions on sustainability

10. I found the experience revealing about

a.my own behaviour related to sustainability

- Strongly disagree
- Somewhat disagree
- Unsure
- Somewhat agree
- Strongly Agree

b.Others' behaviour related to sustainability

11.The most interesting part of this study was:

- a. the transportation challenge
- b. the shopping bag challenge
- c. the energy challenge
- d. the discussions
- e. other (specify) _____

12. Please explain why you found this to be the most interesting part of the study

13. The least interesting part of the study was:

- a. the transportation challenge
- b. the shopping bag challenge
- c. the energy challenge
- d. the discussions
- e. other (specify) _____

14. Please explain why you found this to be the least interesting part of the study

15. Was this experience useful or informative to you? (Yes/no)

16. Explain.

17. Do you think this study would be useful for others to do? (Yes/no)

18. Explain.

19. Did your behaviour or opinions about sustainability change during the study?
(yes/no)

20. Why/why not?

21. Do you think that an app like this would better inform the City of Vancouver about how residents are thinking and acting in sustainable ways? (yes/no)

22. Explain.

23. Any final thoughts or comments on the application?

24. Any final thoughts on the experience?

25. Any final thoughts on this study?

Appendix C. Comparative Data Tables: Mobile GCCP Sample and Statistics Canada Data for Vancouver CMA, 2011

Vancouver CMA (2011)		Sample			
	Number	%	Number	%	
Age					
15-24*	309555	12.57	14	42.42	
25-34	362565	14.72	11	33.33	
35-44	336330	13.65	4	12.12	
45-54	375655	15.25	4	12.12	
55-64	329900	13.39	0	0.00	
65 and up	387315	15.72	0	0.00	
Total	2463430	100.00	33	100.00	
*no one under the age of 19 was included in this sample, so this age category is underrepresented, if anything.					
Gender	Number	%	Number	%	
Male	1202175	48.80	17	51.52	
Female	1261255	51.20	16	48.48	
Total	2463430	100.00	33	100.00	
Marital Status					
Single	852000	43.49	22	66.67	
Married	1106580	56.49	8	24.24	
Divorced	149435	7.63	3	9.09	
Separated	55010	2.81	0	0.00	
Widowed	99685	5.09	0	0.00	
Total	1958880	100.00	33	100.00	
Ethnic Background	Number	%	Number	%	
NW Euro	1353785	55.80	17	51.52	
Chinese	499175	20.57	7	21.21	
S Asia	287900	11.87	2	6.06	
E Asia	113480	4.68	1	3.03	
SE Asia	147195	6.07	3	9.09	
E Euro	471350	19.43	1	3.03	
Other	647715	26.70	2	6.06	
Total	2426235	100.00	33	100.00	
Language spoken at home	Number	%	Number	%	
English	1631365	66.86	29	87.88	
Chinese (Cantonese or Mandarin)	283885	11.63	4	12.12	
Other	524890	21.51	0	0.00	
Total	2440140	100.00	33	100.00	
Occupation Category	Number	%	Number	%	
Management	156610	11.55	0	0.00	
Business, Finance and Administration	222325	16.40	4	12.12	
Natural and Applied Sciences	101405	7.48	1	3.03	

Health	83990	6.20	1	3.03
Education; law, social, community, gov	148620	10.96	15	45.45
Art, Culture, Recreation, Sport	61975	4.57	3	9.09
Sales and service	331590	24.46	3	9.09
Trades, transportation	167640	12.37	1	3.03
Natural resources	17660	1.30	3	9.09
Manufacturing, utilities	38740	2.86	2	6.06
Total	1355520	100.00	33	100.00

Annual Household income	Number	%	Number	%
Under 10000	43705	4.55	1	3.03
10000-19999	67080	6.98	7	21.21
20000-29999	71820	7.47	2	6.06
30000-39999	72845	7.58	2	6.06
40000-49999	73145	7.61	2	6.06
50000-59999	70005	7.29	3	9.09
60000-69999	65325	6.80	1	3.03
70000-79999	60005	6.24	2	6.06
80000-89999	55025	5.73	2	6.06
90000-99999	49190	5.12	2	6.06
100000 and over	332745	34.63	9	27.27
Total	960895	100.00	33	100.00

Highest Education Level	Number	%	Number	%
No certificate, diploma, or degree	111575	8.01	0	0.00
Completed high school	339185	24.36	3	9.09
Postsecondary certificate or diploma	419985	30.16	7	21.21
Received a university bachelor's degr	342235	24.58	19	57.58
Received a postgraduate university d	179455	12.89	4	12.12
Total	1392440	100.00	33	100.00