Personal Media and Wireless Cities:

Towards An Urban Spatial Analysis

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KEYWORDS

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ABSTRACT

For the past decade, at least, varieties of small, hand held networked instruments have appeared on the global scene, selling in record numbers, and being utilized by all manner of persons from the old to the young; children, women, men, the wealthy and the poor and in all countries. Their presences bespeak a radical shift in telecommunications infrastructure and the future of communications. They are particularly visible in urban areas where mobile transmission network infrastructure (3G, 4G, cellular and Wi-Fi) is more established and substantial, options more plentiful, and density of populations more dramatic. These end user products—I phones, cell phones, Blackberries, DSi, DS, IPads, Zooms, and others – of the mobile communications industry are the latest, hottest globalized commodities. At the same time, wirelessness, or the state of being wireless, and therefore capable of taking along one's networks, communicating from unlikely spaces, and navigating with GPS, is a complex social, political and economic communications phenomenon of early 21st century life.

This thesis examines the specter of *being wireless* in cities. It lends the entire idea an experimentally envisioned, historical and planned context wherein personalization of media tools is seen both as a design development of corporate, artistic, and military imagination, as well as a profound social phenomenon enabling new forms of sharing, belonging, and urban community.
In doing that it asserts the parameters of a new mobile space which, aside from clear benefits to humankind by way of mobility, has reinscribed numerous categories including gender. Moreover, it posits the recognition of other, more nuanced theoretical spaces for complex readings of gender and gendered use, including some instantiation of the notion of 'network' itself as a cyborgian and gendered social form. Additionally, cities are studied as places where technology is not only quickly popularized, but is connected to larger political interests, such as the reading of data, tracking of information, and the new security culture. In so doing the work has been undertaken as an urban spatial analysis and experimental ethnography, utilizing architectural, feminist, techno-utopian, industrial and theoretical literatures as discursive underpinnings from whence

understandings and interpretations of mobile space, the mobile office, networked mobility, and personal media have come, linking the space of cities to specific, pioneering urban public art projects in which voice, texting and MMS have been utilized in expressions of ubiquitous networks and urban history. Through numerous examples of techno art, the thesis discusses the 'wireless city' as an emerging cultural, socially constructed economic and spatial entity, both conceived and formed through historic processes of urbanization.

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Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution.

To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made

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Molly Hankwitz, December 2010, San Francisco CA

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INTRODUCTION

> The third wave, just beginning, has many computers serving each person everywhere in the world. I call this last wave "ubiquitous computing" or 'ubicomp'. (Marc Weiser, "Open House", 1996)

Contextualizing the Research

One of the most significant developments in personal communications in the last two decades has been the pervasive installation of mobile networks, satellite-driven navigational systems, the subsequent emergence of 'itinerant media' (Richardson 2006) and its attendant wireless economy. This includes all forms of mobile networks from cellular 3G and 4G, to wireless broadband and Wi-Fi. (See Glossary, p. 266 for definitions used).

By comparison, to the thirty-odd years of sustained distribution and implementation of personal computing in most sectors of Western society, acceptance of mobile communications has been comparatively swift and diversified. It brings with it complex cultural imaginaries which have yet to be adequately dealt with such as 'wireless cities' and 'wireless subjectivity'. Computer-enabled, networked (and even wirelessly conceived) cities, however, have historical precedent in design practice and visualization. They have been dreamed of and visualized by architects, artists, and planners and aspects of wireless mentality and existence have driven theory and the conceptualization of social philosophy. Meanwhile, mass familiarity with landline and portable telephones, developments in widespread computer literacy, the "home" context of personal computing and the digital revolution form solid foundations from which mobile communications can be marketed, popularized, and theorized. Some differences, however, exist between, broadly speaking, the rapid uptake of mobile communications and that of personal computing as argued within.

Early Wireless Urban Space

The research project began investigating changing parameters of urban space once wireless networks were perceived to shift concepts of location away from enclosure and introduce new enclosures into public space. Few cities in 2000 had more than partial, official Wi-Fi zones or districts and municipal governments were setting up test networks for use along café streets where prolonged laptop use was frequently the pastime of customers. Wireless zones in Adelaide and Brisbane were installed to improve café connectivity and sustain the lingering clientele and support business with Wi-Fi. Amidst this early period of wireless implementation, a phenomenon known as 'war chalking' developed in an ad hoc, underground framework and spread globally due to the Internet. War chalking was performed by hackers carrying laptops equipped with wireless antennae "cards" capable of picking up the signal. (Jones 2002; Loney 2002; Ward 2001; 2002; Mitchell 2003, 226) It was a fun and experimentally social response to the early phases of wireless networks when unsecured bandwidth literally "leaked" into cities from antennae, transponders, and wireless modems. The bandwidth was free and it was a slightly risky, therefore enticing enterprise, to test the free wireless in public space. War chalking and 'war driving' its car-dependent version, (2003: 226;) both exploited unsecured bandwidth. A laptop made wireless (with the insertion of an approximately sixty-dollar AUD wireless card in c. 2004-5) would be locate free bandwidth along the urban streetscape. Indeed entire films were downloadable as the Internet could be surfed at deliciously high speeds from the privacy of one's car interior. (Notes of the author, Brisbane, 2004) In 'war chalking' practices, the wireless access points were then marked in chalk where possible, on sidewalks and walls, in a symbolic code indicating 'open' or 'closed' nodes for the use of other "war chalkers". A hobo-like practice, whereby resource sharing (in this case bandwidth, not food) went on in a community, 'war chalking' celebrated cooperation about free network access. Moreover, it is argued here, the practice invigorated debates about the possibilities of free-wireless-for-all.

Thus, wireless mobility has been conceived, from the outset, as an incoming technology, as radically changing spatial relationships, first by altering relations of location, hence the

experimentation and interest in locative media, and secondly, as a result of complex new functionalities attributed both to laptops---carryable computers and increasingly powerful machines---and mobile devices---cell phones, Personal Digital Assistants. (PDA), and other handheld devices.

Historical Context for the Thesis Argument

The research in this document spans an approximately six year period from 2004 – 2010 and it has been an effort all the while to comprehend the multifarious transition, across a spectrum of locations, which civilizations are making in becoming wireless transmitters, and mobile users, as a result. The work has taken place in urban contexts across several continents through periods of travel and dwelling. Numerous literatures have been utilized and case studies of mobile usage among women artists (Chapter 1) and in political activism (Chapter 6) have been created. In Chapter 3, a spatial analysis is given explanation in order to foreground discussion of 'emerging socio-cultural and techno-corporeal effects of mobile interactive media' (2006, 1), their networkability among various, specifically defined "mobile identities" and the permutations and parameters of mobile space as it is created as an urban *form*. A succinct 'roadmap' for the logic of the argument is also offered to assist readers in navigating the text and establishing an overview of the work. Summaries for each Chapter are given at the end of this Introduction.

Foremost in the argument is an attempt to reconcile the increasingly universal use of urban wireless communications with local and culturally specific particularities of its use. The candidate's observations and experience of incoming wireless, while living in Brisbane, Australia, traveling in Australia, and living in the Mission District, a lower-income, ethnically diverse neighborhood of San Francisco, CA in the United States is frequently referenced for this purpose. Likewise, travel-based observations are made and referred to and an urban history of public computing and networks is laid out with respect to the rich tradition of public media support in San Francisco. Clearly, with respect to overall federal responsibility for wireless infrastructure and implementation, Australian government policy differs significantly, and is considerably more

equitable and sophisticated, that the highly unequal free market dominated networked space in California or the Unites States.

Comments on Australian and American Contributions to the Text

Conducted on the Internet and in cities across several continents, this research has been developed primarily between two economically and spatially distinguishable urban cultures, that of Brisbane, Queensland and that of San Francisco, California. Neither city is a global city as per Saskia Sassen's definitions and lists (Sassen 2002) but, both have strong histories of media and communications and are cities striving to globalize and urbanize. In San Francisco, the added dimension of proximity to major military, satellite and silicon centers gives its communications culture a special twist.

Brisbane's online culture began to take off and establish itself in the early 2000 through 2004, especially in university curriculum, advertising, and among younger urban artists working from home. (Notes of the author)

By comparison, San Francisco is a highly technologically mediated city, both geographically and in terms of its visionary communications history. It is the central cultural hub of the West Coast north of the famed Silicon Valley. It is a place where media, and its experimentation and invention is transparently close to its community from Edward Muybridge's first photographic experiments funded by Leland Stanford, founder of Stanford University and railroad entrepreneur, to the development of television some of which took place in San Francisco studios, (Baldwin, *Specters of the Spectrum*, 2000), its proximity to the National Aeronautics and Space Administration, (NASA) and location adjacent to the telecommunications "boom towns" of the Peninsula and "the Valley." As its nicknamed suggests, the Valley is a telecommunications industry and research center with deep ties to both government research and the military. (Notes of the author). At the same time, San Francisco is notorious for unique, utopian experimentation in community-based media arts both outcroppings of significant anti-war activism as well as the radical counterculture (Summer of Love, The Whole Earth Catalog). It has a diverse range of highly visible alternative public cultures and ethnicities that have thrived to create political

tolerance for immigration as well as the reputation and power of California as a utopian state. Australian media culture, particularly the Fibreculture list-serve experience in which the author participated, and the culture of Brisbane's Strait out of Brisbane new media festival, along with research culture at QUT, and experiences curating and organizing Multimedia Asia Pacific, were especially important to the understanding of the work. There has been substantial critical learning and influences in Australian new media art and scholarship, as well as Australia's cultural relationship as a media nation with the rest of the world.

English Language

Because the research has drawn heavily on both Australian and American contexts, some usages of language and syntax may diverge, when reading. For instance, the term 'neighborhood' is an American word for what is referred to in Australian English as a 'suburb'. There is an Australian 'suburbia' but it does not reflect the Australian urban districts called 'suburbs.' Another difference is use of 'council' to discuss municipal government. This is an Australian usage, and is almost never found in American English, except with reference to small town councils, usually referred to as 'boards.' The author uses the term 'council' when referring to Australian cities and 'municipal government' to make appropriate generalizations about all municipalities. The equivalent term for 'council' in San Francisco would be Board of Supervisors.

Secondly, cell phone' is a more common way to refer to the handheld telephone in America, while 'mobile' or 'mobile phone' is common in Australia. These two terms for the handheld telephone are used interchangeably throughout the text, largely because the author began studying mobile telephony and owned her first mobile phone before returning to the States to write. Additional terms are defined in the Glossary section at the end of the document and are assumed universal, though not necessarily universally deployed.

History

The research started at Queensland University of Technology (QUT) in 2004. In 2005, the author

was recipient of one of three Innovation Stipends from the then Creative Industries Research Applications Centre (CIRAC) at QUT. The thesis has since been the product of in person and 'distanced' supervision with Dr. Terry Flew, ARC Centre for Excellence in the Creative Industries and Innovation, QUT, and author of numerous books on the participatory media sphere in the global and new media context, and under joint guidance and support from the late, Stephen Wilson, PhD, Conceptual Information Art Department, San Francisco State University and author of *Art+Science Now* (2010), as well as five other books devoted to crossovers between art, science, and technology which date back to 1986.

Motivations in the Research

In terms of the author's research questions, then, with respect to the study of wireless urban space, advances in portable culture and cities need be coupled and the research began to revolve around sophisticated directions of cultural analysis: gender, representation, history, and technology as urban interface; the techno-history of micro computing.

- The developing techno cultural "sphere" of marketplace advertising has celebrated, from early on, the user as a male business professional typically enabled with portability."He" was the one who traveled. "He" was the one with access and an important job--both in the context of laptops and cell phones. This is documented and discussed elsewhere within the thesis text. Its dominance as an image of the user influenced the self conscious decision to balance out this privileging through the construction of a case study on portable tool use by professional women new media artists.

- Efforts to round out further, the discussion of mobile "types" with alternate frames of reference for "use" was also a concern when looking at activism and mobile use.

With respect to the case study on women artists, however, there was considerably context to suggest that professional artistic careers have transformed in the digital age and because of new media and portability. This lead to the inclusion, on the authors' part, of an important *mobile*

subject—the international or transnational woman artist—dependent upon travel and portable communications for her career. Given the number of women artists involved in new media populating list-serves such as 'faces' (see Appendix) and the contemporary right of women to travel and enjoy mobility, the case study was prepared in particular, to study the circumstances, choice making practices, and usage requirements of highly mobile, itinerant, and professional women artists.

With respect to activism and mobile communications, the thesis marks a particular moment when the anti-globalization movement was breaking new ground and gained political recognition due to its use of the global Internet, the development of Indymedia, and the regular visibility of its protests. It was an obvious question to consider the use of portable technologies and mobile networks in this social movement, especially when certain continued efforts to thwart activity by police, through confiscation of tools, were routinely reported and increasingly violent. Reports of events, across a spectrum of protests from the Australian refugee crisis to the Republican National Convention in New York in 2006, in which portable communications were central to the independent media or media activism became relatively common and it was the perception of the author that much of this had gone under documented, theorized or discussed. Therefore these concerns helped to formulate a more apparent set of questions and to guide the production and direction of the thesis. They are outlined below.

Questions Guiding the Research

1. How is gender represented in mobile marketplaces and where has it been written about and studied, specifically with respect to personal and mobile communications?
2. How are mobile tools beneficial to activism and protest culture?
3. Are mobile communications markets, including all forms of cellular and wireless devices, creating new kinds of mobile divides and if so, how do they manifest, on what grounds are they new, on what grounds are they some extension of other divides, and where do women fall in this area of research?

4. How has been/is urban public space being conceived and differentiated within substantial published research and significant creative technology projects?
5. Given that wireless cities are incoming as entire social projects, are there useful models, especially in architecture and network theory, for examining networked urban space and, if so, what are they and where are they to be found?

Synopsis of the Central Argument

Contemporary reasons to consider the particulars of wealthy Western nations with respect to wireless abound. The most powerful marketing mythologies, conceptions and images of wireless are exerted through advertising, global television, and print media emanating from wealthy, globalized western cultures and the World Wide Web. This expanding global marketplace influences populations in the internationalized spaces of transit throughout train and bus stations, airports, tourist industries and through the cacophony of advertising found in urban areas. The narratives of these powerful marketing mythologies tend to produce an observable hegemony of values—gender, race, class---while cities themselves possess vastly different media histories. When it comes to the development of colloquial communications and the implementation of media culture into daily life, cities must be observed. San Francisco, California absorbs new technologies through the context of Silicon Valley, militarization, Hollywood, and a long history of hobbyist tinkering. They are transformed by a highly politicized, diversified, and freewheeling set of urban publics into all manner of commercial and non commercial community-based networks and projects. San Francisco is a media melting pot of considerable sophistication, driven by free market capital on the one hand and by community based politics on the other. Beyond those larger questions guiding the research have been efforts to engage with public computing histories in the Bay Area.

Death of War Chalking

Approximately ten years after the death of war chalking as a hacker pastime, wireless networks more often than not, are either cellular only, or they are Wi-Fi belonging to specific municipal campaigns for the hospitals, public library and school systems. And this varies widely from place

to place. London, England for example, is noticeably devoid of free Wi-Fi in public space and global positioning with an iPhone is nearly impossible due to the clouds and fog. There is comparatively much more free wireless in the city of San Francisco and Google is now, as of 2011, slated to provide high-speed Wi-Fi bandwidth across the city, however, currently, and within the last five years, most Wi-Fi has been in the form of secured, privately paid for and password-protected home and business usage. There is no 'city-wide' Wi-Fi, per se, except in the municipal networks of public library, schools, universities, and hospitals. Cafes, in the period from 2004 to c. 2008, became an urban network of free Wi-Fi and simultaneously, customers ceased to find pay-for terminals, or pay by the hour "card" systems for Wi- Fi access, such was the presumed ubiquity of the laptop. Thus, access/usage plans, antennae, and modems for all types of non-wired networks, free or not free, and half a dozen commercial wireless carriers form the basis of an urban 'wireless economy' which while useful and widespread, is still not seamless. With so many new wireless multifunctional devices and Internet phones requiring Wi-Fi for certain services, this position is bound to change and, arguably is being "pushed" in the Google free Wi-Fi project for the city which has been going on for half a decade.

Wirelessness is thus defined as a state of being in the world and communicating wirelessly that utilizes a variety of possible networks from cellular to 3G to 4G to GPS, Wi-Fi, and broadband or versions of these. A multitude of new, secured networks and of networks of free Wi-Fi in designated areas of cities, attached to districts, or secured in small businesses and private homes now dominate the wireless spatial landscape, while fast, free wireless bandwidth remains relatively scarce, except through cafe circuits and municipal wireless projects as aforementioned. Transitions to wireless electronic futures, beyond war chalking, have become apparent in this brief ten-year period from approximately 2000 to 2010. Faster speeds, higher resolution screens, applications for handheld devices, 'cloud computing' and memory have become important. Multifunctioning handheld devices are in as comparatively high demand today as all things "multimedia" were long ago. As Richardson observes about mobile phones, they are 'part of a more general telematic trend towards wearable, handheld and pocket communications and

entertainment media.' (2006, 1) This trend is hand in hand, for instance, with the Google effort to carry a free Wi-Fi project in the city, as mentioned above. The tools and the networks have a symbiotic relation.

Equity and Economics

In a rudimentary analysis, those owning first generation 3G, and now 4G iPhones, Blackberries, iPads, or other similarly equipped devices, and devices equipped for Wi-Fi, or those with high-powered wireless laptops are prepared for mobile living and nearly unlimited access (as long as they can afford it) to the 'Wireless Anywhere'. Those without, however, or with simpler tools, have limited access to its benefits. At the same time they must co-exist in the prevailing communications economy. An AT&T data plan for the current iPhone, which allows unlimited wireless data and texting, including MMS, costs in the realm of $200.00 US per month and 'considerably more in other parts of the world.'(Cox 2010) The rising current costs of these plans and tools, arguably, create mobile divides when high speed, personalized, sophisticated multi-channel multimedia is the growing content market and direct access to 'rich' information is desirable. As a result of fees, these devices are considerably less common than ordinary cell phones, creating an unequal condition of access and ownership from the start. However, in terms of the tool, this inequity may simply be as important as the difference between owning one kind of TV or another. What does it reflect critically about urban space and/or mobile divides? Can we make mobile tools, which operate across these boundaries and create greater equity for all? *The Transborder Immigrant Tool Project* from artivist/hacker Ricardo Dominguez, Brett Stallbaum and b.a.n.g lab has been extremely controversial in the United States because of the politics of the Mexican/US border around which its free software application and use of off-the-shelf phones, says 'yes, we can' make tools that profoundly alter the private commodity status of the cell phone and which put cell phones and customized software into the service of people quite inexpensively. (TBTools project, 2010) As Richardson writes of mobile interactive media, 'handheld games and portable multimedia devices are becoming increasingly sophisticated, and should be examined both in terms of their potential merger with mobile phone functionality, and in their own right as

nascent new media forms.' (2006, 1) Mobile telephony and Wi-Fi provided communications and even access to the Internet among poorer populations and nations where landlines may never have been installed. (Castells et al, 2007,7 - 11) At the same time, accessing the Internet is one of the primary uses for mobile devices, as Sadie Plant has observed. (Plant 2001 in Richardson, 2006, 1) Multitudes of cellular networks and mobile phone "trees" are forming infrastructure which is shaping new urban landscapes suggest Kane and Miller in their study of Los Angeles. (Kane and Miller in Varnelis, 2007, 146-157) Handheld devices such as iPhones and iPads, represent the high end of the trend-setting portable machine and new "channels" for obtaining information via filter applications, make a phone call, text message, or which receive TV or video are beginning to permeate cities. Multiple competing futures to wireless communications are thus apparent in the plethora of tools available today. The elegant Blackberry, iPhone, iPad, iPod for teens and adults and the numerous wireless games devices for children (DS, DSI, Playstation, Nintendo Gameboy) make visible a growing urban fabric of wireless users from all generations. (Richardson 2006, 1-3) These gadgets suggest what is sleek, mobile/portable, "social" (gaming) and at the same time, in some cases, are pocket-sized computers of great power (iPhone 4 has 14 gigs of Memory). A growing presence of wireless connectivity is also apparent and already variously designed touchable displays, suggest that "soft" manipulable interfaces are the future and that paper reading materials---books and newspapers –may soon be a thing of the past replace by online media as well as electronic reading surfaces. Disposable computers, such as those that fold like paper and use e-ink, follow the innovative, sustainable design mentality of designers such as Karim Rashid. (Hustwit 2009) In these 'green' times, wireless gadgets are a tremendous bolster to cultural trends of 'going paperless', while the environmental cost of creating millions of handheld gadgets and/or running them, has yet to be coherently calculated. Solar battery chargers are but one crosscurrent in this scenario, suggesting user-controlled, environmentally perceptive methods for powering one's tools. iPad instruments are lightweight and un-machine-like, intersecting with the culturally loaded new economy of everything clean, 'green', and "future". Mark Weiser's vision of ubiquitous computing and the 'disappearing machine' becomes *observable* in this context though perhaps, not quite, as he would have intended. (Weiser 1991; in

Galloway 2004, 386) At the heart of his invention of 'ubicomp' was a notion that humans would not only have computing, but would "dwell" with computers in the future. He wrote: 'the imbedded computers of 2005 will bring other worlds to us in new ways-- sometimes in ways so unobtrusive we will not even notice our increased ability for informed action.' (Weiser 1996a, 5) His theory embraced the concept of 'calm' technology. Ubicomp was first tested on "tabs, pads and boards'" built at Xerox Parc between 1988 and 1994.'(Weiser 1996b)

Municipal Developments

City governments are deploying municipal wireless infrastructure at a very slow pace. Free Wi-Fi, as a municipal area-wide idea is found in the States only in smaller cities or towns, or in extremely uncommon projects such as Philadelphia's city wide access program discussed in Chapter 3. There are at least two possible reasons for this. Wireless is new, therefore, unfamiliar and, until recently somewhat untested (wireless standards of 801.11a band 801.11b, etc, have been debated). Secondly, obstacles exist at the level of city government bureaucracy; financial, political and social arenas. In San Francisco, complex contract negotiations and deciding on a carrier tied up negotiations. (For some time Google and Earthlink debated sharing the contract). Choosing a carrier was also a concern for Brisbane City Council IT in 2004 which had installed a temporary wireless project on Queen Street mall to target 'laptop users.' They had plans of similar test installations for Fortitude Valley and Brunswick Street, and a broader agenda of the wireless 'smart' city of Brisbane. (Brisbane City Council interview 2004) As of early 2009, municipal wireless projects and projects in individual businesses were visibly being utilized in Brisbane's West End and at Queensland State Library. (Notes of the author)

Unequal bandwidth distribution, educational splits, and varying attitudes towards the perceived need for technological and media ownership, both generational and income-oriented impose divides which impede public access. These divides tend to reproduce the social logic of class systems, race and gender-based inequalities, much as Steve Mann, a contemporary of Weiser's, predicted 'smart space' would. (Mann 1996) Mobile and digital divides undermine rights to public information, freedom of opportunity in employment, and knowledge that now comprise

interaction with contemporary urban life on some level. Lower-income neighborhoods show significantly disempowered education, ownership, and user patterns, where technology is concerned. This is largely generational and income based, with older people having considerably less understanding and ownership than younger. (Berman 2007) Aging populations tend to fall out of the loop altogether, especially where literacy and new skills are concerned. (Berman 2007) Other reports indicate that older people, particularly those with glaucoma, are a hot market for the iPad because they can read by the bright screen. (Kim, 2010)

Twenty-first Century Cities

As the 21st century gains in network-dependency and networks become more ubiquitous, equity in communications literacy and ownership is critical to the basic planning of cities and the retooling of existing systems. Movements to control the airwaves through community-based Local Area Networks (Bay Area Wireless Research Network, SFLocal Area Network, BrisMesh—see Appendices for further description) involve sharing and cooperation (Rheingold) through deployment of free wireless outside official networks. These community-based LANS form the basis of mobilization to share resources, avoid surveillance, and cut cost, much as early video collectives (Bay Area Video Coalition), experimental television networks (Paper Tiger TV, Deep Dish TV, Community Access Technology-Sydney) or autonomous servers (xs4ll, Octopod, Thing.net) did for video and the emerging Internet.

Wireless State of Mind

Being wireless, is thus, arguably, encouraged through advertising, blockbuster films, pervasive ownership, the marketing of wireless children's' toys and chip-enabled household gadgets. Wireless behaviors and the imagination of wireless culture exist outside of the representative technology, however. Android, iPhones, smart phones, iPads, DS, Playstations and an array of wireless notebooks populate consciousness, while the wireless laptop is quickly becoming an international telephone through Skype calling, whether one carries it or leaves it at home, and mobile phones carry the Skype application, cutting international call cost by half.

While cellular networks have long been more affordable than traditional landlines, they are not less expensive than installing Wi-Fi, which may inevitably overtake cellular as the dominant wireless technology. Mobile communications, with its emphasis upon voice and simple texts, has gained social acceptance, rapid deployment, and broad implementation in all its forms. It is not only a widely accepted set of social practices (Plant 2000) all increasingly commonplace, but is also culturally diversified, engaging many kinds of users and affecting greater numbers of people and populations than older forms of "new" technologies. Most importantly, perhaps, to this analysis, is that generations of young people born into the mobile, wireless age know nothing but this mobile techno-social reality.

The state of b*eing wireless and being mobile* thus shapes urban space through its objects, its networks and its reiterative, recursive dialogues within networks. New spatiotemporal relations of location, users, and infrastructure make communications possible where previously impossible. This fact leads to new interpretations and uses for cities themselves. The new online resource, under the rubric 'Liberating city data', DataSF.org, allows anyone to search data about the city, obtain maps and data visualizatio**ns.** Obvious examples of urban or "other" use would be mobile, usually Wi-Fi, networks engaged for disaster relief, where landlines and wired Internet fail to work, or in mobile art, where new communications spaces for urban publics show much promise. (Build Your Own World, 2010) Moreover, the recently popularized mobile phone data tool, Twitter.com, and similar mobile data application (the iPhone has dozens of downloadable social media applications) portends hand held communication to be the new mediator of community information. Development of the 'mobile anywhere' will thus possess a multitude of social and cultural "mediums" for shaping its future use and cities, where much of the class stratification associated with technology is visibly expressed, are thus relived [and reinscribed] against the unequal vicissitudes of neo-liberal economic power (Iles and Slater, 2009). As we participate in the 'flexible utopia' (Gregg, 2008), on what grounds is this 'mobile anywhere' truly flexible, and for whom? We see the future of "now" illustrated through the attractiveness, fashion, wellness, and apparent income levels of a hegemony of mobile "types". However, space, place and location

are only spuriously and superficially recombined in this context. There are complex sets of cultural differences tied to real material and immaterial, co-present spatialities found in cities.

Overview of the Research: Chapter Content

The document consists of a Keywords, Abstract, Table of Contents, brief Introduction, seven interrelated Chapters, Conclusions, an Appendix: Glossary of Terms, Filmography and Bibliography. The flow and ordering of the Chapters was determined by the logic from which the thesis emerged and the Questions Guiding the Research.

Chapter 1 - Co-present Social Differentiations in Wireless Communications. This Chapter looks closely at proxemics, co present analysis of mobile telephony, and gendered use starting with of Hall's analysis of personal space, then issues of personal enclosure in Plant and Mitchell. New spatial and social intensities are drawn out of the literature to study engage with changing relationships of public and private, and the intensification of work, family, romance and friendship in mobile culture. Personal architecture of boundary and choice making and the body in the city are examined first. Small-scale tools and personal space are studied in terms of decoration, symbolism, exteriorization, and interconnectedness. These subjectivities illustrated by Plant, Mitchell, Townsend and others, are addressed as part of social differentiations. Intimacy in Hjorth, Milne and others is examined alongside proximity, interpersonalization, audio and visual disruption of social space; behavior, dependency, and the construction of personal identity. These properties are set into contexts of mobile use and gender utilizing Hjorth's studies among others. Finally, mobile imaginaries, navigation, location-based media, and specific public projects which utilize text and navigation are offered in a detailed examination of mobile communications as it augments urban processes and engages public authoring and participation.

Chapter 2- Gendered Use, Mobile Women, and Wireless Media. This Chapter examines 'gendered use' and contrasting approaches to the topic in the available literature. Castells et al global gender studies, Hjorth's studies, and those of other researchers are utilized. Observations on changing perceptions of the tool, drawing from Plant, Lemish and Cohen, and early studies by Rackow and Navarro, among others are made. The Chapter also situates my original research on

women new media artists within contexts of gender and mobility, making the argument that user-based research is ethnographically superior to abstract statistical analysis of women's' mobile lives, despite the worth of the latter literature. Practices of customization, the object as "Other", decorating and naming are also addressed. The Chapter also looks at liberation myths and fantasies of distance and longing, drawing off travel discourse in recent scholarship and the history of women's personal mobility. Portions of Dr. Melissa Gregg's critique of flexibility, labor, and female identity in ads is explored, including deeper discussion of female types, career women and motherhood in relation to technology. The Chapter finishes with my own study of women new media artists and an analysis of the findings. Participants in this research included professional artists from New Zealand, Australia, Europe and North America.

Chapter 3 – Wireless cities and Pervasive Networks This Chapter examines debates arising because of pervasive computing and its impact on urban space including universal access, digital inclusion, and social movements towards city-wide Wi-Fi. Chapter 3 discusses wirelessness as an idea citing specific "trial" projects and offering examples of localized Wi-Fi projects, while discussing the benefits of 'wireless' over 'wired' for the consumer. It then looks at pervasive computer networks in terms of automation and surveillance before offering a 3-part analysis of global/local based upon borders: international, urban planning, architectural (buildings), and personal boundaries, changing urban surfaces: security/privacy, public/private space, and the panopticon of Orwells' Big Brother, recombinant theory (Graham 2003,113), media architecture, pervasive electronic messaging, elements of dis-enclosure, mobile subjectivities in 'co-presence' (Hjorth 2005) and extension as vector and self. The Chapter concludes with a brief assessment of the changing public commons.

Chapter 4 – Mobilizing Urban Space This Chapter introduces theoretical positions on the networked city, beginning with Foucault's critical revision of the disciplinary society contrasted with Deleuze's perceptions of the society of control, then moves through various complete depictions of the networked city (Mitchell 2003), including architectural theory, digital architecture and 'animate form'(Lynn 1999), experimental architecture,(Cook et al, 1972) and

nomadic space (Headmap 2001), with some discussion of 'flexible utopia' (Gregg 2007) and 'post-urbanism' of Sumrell and Varnelis. (2007) It is a foray into mobile communication and computer networks from corporate industrial film, architectural history and the history of art. It grounds the thesis within an understanding of concepts of the 'wireless city' which emerge today as complete 'entities' and offers contrasting philosophies for mobile communications in the context of the city. Chapter 4 contains an 8-part analysis of the networked structure of architecture and urban space. Finally. it looks briefly at critical positions on mobile identity and surveillance in the pioneering inventions of Dr. Steve Mann.

Chapter 5 –Technological Diffusion as Urban History This Chapter discusses the current state of pervasive computing and mobile communications; decentralization as a result of the personal computer. The Chapter looks at early conceptions of the value of the personal computer versus the sometimes visionary designs of groups such as Archigram, the Situationists, or designers such as Francois Dallegret exploring mobile architecture and nomadism. The Chapter explores the revamping of personal mobility through raised cities, elimination of street traffic and computing. The transformation of work relations, mobility of data, advantages and disadvantages of new workspaces, and the growing role of 'personalization' in terms of work and place-making is also discussed. Finally, decentralization is viewed in the context of Barry Wellman's sociology and the Netville study (2003) and his discourse on residential computing and personal networking. The Chapter annotates Wellman's observations on relevance of the household unit and Wellman's early views on mobile telephony as part of the complex computing/communicating household. The Chapter concludes with user-friendliness, place-making with personal devices, affordability, and benefits to artistic practice, arguing that the personal computer revolutionized daily life and as part of private studios and habitats to set the stage for uptake of mobile communications as a future, increased miniaturization and mobilization of data.

Chapter 6 – Mobile Media in Recent Activism Chapter 6 shifts the thesis from the city as a planned or envisioned whole, to its particular as a place in which urban cultures protest to human events. Chapter 6 is a foray into the culture of protest as public demonstration and street protest.

The Chapter includes numerous examples of mobile media in this service, from various countries where I participated in demonstrations, and or worked with activists during the period from 1998-approximately 2004. Its content responds the successful deployment of alternative media, particularly the global Internet in the anti-globalization movement, thus to the successful use of mobile media in activism. The Chapter also offers detailed examination of 'rituals of protest' (Lovink in Miekle, 2002) covering mobile tactical practice and detailed examples of wireless media used in protests. Four mini-studies support the argument that mobile tools enable activism and that quantifiable progress due to mobile tools has improved communications in street activism.

Chapter 7 –Personal, Social, and Transnational Urban Identity Chapter 7 undertakes the articulation of wirelessness imagination as a contemporary state of self hood and personal identity with respect to the real phenomenon of mobile media tools and networks, result of marketing campaigns, trends, literature and its pervasive use. It looks at ideological modalities in mobile use; its *real politik*, and attempts frameworks for mobile culture with respect to ethnography and experience. Two perspectives in particular, personal and individual use versus the 'space of flows' (Castells) are contrasted in an effort to position the self/body. Chapter 7 thus investigates wireless identity, pinpointing 'realities' for identity as found in the literature, while contesting these identities and asserting technological imagination, freedom from technology and the dead end of practicality when it comes to creativity and identity. Techno art projects are cited utilizing wireless technology while positing positions on the body and cyborgs. Finally, the realm of urban community, particularly immigrant community, and the formation of identity-making practices with respect to proliferating trans nationalism is presented.

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CHAPTER 1

Co-present Social Differentiations in Personal Wireless Communications

> More and more [the mobile phone] is…perceived as an extension of the body, again more in a virtual sense than a purely physical one'. (Townsend 2000, 7)

Introduction

This Chapter examines the mobile device and the personal space developing around it in detail. It looks at proxemics, co-present analysis of mobile telephony, and explores the connotations and parameters of mobile social space as developed through gendered networked mobility. At its heart is a focus upon the intensification of everyday life through mobile devices, as well as personalization and customization practices in accordance with their urban use and physical wearability. Co-presence, intimacy, gender and economic class are discussed as properties of mobile culture.

Defining Personal Space

The relationship between bodies and mobile devices, in this instance, cell phones, is at first, obvious. Linguistically, there are references to the body. 'Handy' in Central Europe, 'kannykka' or 'kanny' in Finland, means an extension of the hand. It was a Nokia trademark that passed into generic parlance. (Adrian 2000; Silberman in Townsend 2000, 7; Plant 2001,23) Sadie Plant devotes several paragraphs to these nicknames in her seminal early study, funded by Motorola, On the Mobile. (2001, 22-3)

As an extension of personal space, mobile devices, also, however, take on associations with privacy of person and individual sovereignty.

‘Personal space’, defined as the immediate space around the body that encloses it, as in one's “bubble”, has considerable importance to the study of mobile telephony and mobile use. Edward T. Hall, an anthropologist, in his 1967 book, *The Hidden Dimension*, invented a science of proxemics or the study of spatial distances and personal space.

Proxemic science divides space into four realms: within 0 inches to 1.5 feet (0–45cms) for intimate space, within 1.5 to four feet for personal space (45cms to 102cms), anything from 4 to 8 feet as social space and 8 to 12 feet for public space and beyond. These distances demarcate individual “comfort zones” for situations such as personal touching, having one’s belongings touched, close talking, and so forth.

Personal space is also cultural. It differs within class, gender and social contexts. It plays a role in various spaces from acutely residential to that of open streets. In large cities, where, for instance, public space is conflated by non-intimate bodily proximity, over-crowding and the resultant anonymity of self, personal spaces is a concept deeply integrated, even legally, into the daily organization of social life. Large cities are arenas of intense intermingling and homes to polymorphous values for the body in terms of cultures, subcultures, class stratifications and so forth. Personal attitudes, choices, fashion, feelings, and touch lie in contrast as part of the daily organization of life. Mobile technologies, such as the Sony Walkman and the cell phone, since the mid-eighties, have appeared in urban space. These devices, carried on the body, allow for a customized spatial and environmental experience. Hand held augmented reality will soon contribute widely to this re-spatialization and organization of urban space. Hand held and wearable tools have changed the parameters of proximal social space and its analysis, adding according new psychological and social definition to pre-existing patterns of behavior and new intensity to the urban.

Personal Privacy and Enclosure

Articles of clothing, bedrooms, bodies, car interiors, hard drives, individual workspaces, offices and now mobile devices make up our personal space in terms of boundary-relate privacy,

enclosure and/or emblems of self and individuality. Arguably, despite tensions around invasive use in public space, cell phones construct an enclosure of privacy for their users. An invisible, "bubble-like" space of enclosure is created by the cell phone. From the turning of a back, a spatial move to an alcove, corridor, or another room, new forms of gestural and specific enclosure are sought. Personal space obtained in this way creates evidence social rules about personal privacy, acoustics, and what does or does not take place publically. Social boundaries, thus, become inexorably bound to the act of public, mobile telephony, both for the speaker and receiver as well as anyone listening. This implies a tacit reciprocity negotiated between the caller and the eavesdropper or onlooker. How close one sits to a phone caller, how and when potential listeners opt to use headphones, and/or move and turn away are spatial demonstrations of and acknowledgement of, personal space, in the sense of what Cooper and Haddon generally consider part of the 'co present' condition of mobile culture. (Cooper in Haddon 2000, 5). Turning away, sitting alone, or exiting to speak or text are all means of personal control by the user or the audience. (Plant 2001, 33) These moves acknowledge the private call as a public act which privatizes space in common. This mobile space, this '[being in] a private network', immediately forms one-person enclosure with highly-regulated boundaries. (van den Boomen 2000; Mitchell 2003, 7-9, 10, 19)

New Spatial and Social Intensities

Increasingly intermeshed with mobile networks, "device use", the many activities associated with it, Hall's original definition of personal space, and elaborations upon that, have evolved to include both "new" and transient as well as traces of social behaviors which accompany previous eras of phoning and its social culture. These social behaviors, arguably, are remediated as they remix with mobile conditions, yet reiterate the past. Listening in or not listening in would be one example, as the behavior belongs to old and new telephony.

That there are new social rules in public and even laws to regulate or prohibit the use of cell phones while driving under certain circumstances , for instance, is also obvious, but under further examination, also presents much complexity. Polite behavior in small shops, restaurants, at the

symphony, now includes turning off the cell phone and observing enforceable codes of conduct such as 'no mobile zones' in hospitals, airplanes and cinemas (2001, 34 – 37) These regulations are exerted across cultures and in international travel. Where added threat of terrorism has lead to increased concern and perversities such as the British 'shoe bomber', Robert Reid (2002), have forced new boundaries to become, arguably, an essential component of transit and urban space. Thus, they are a strong, social influence upon public/private interaction and they effect public spaces, institutional discourse, and interpersonal space.

S.1 Summary of Social and Spatial Shifts

a) Intensification of familiar social conditions through the extension of these conditions into public and private space via mobile networks. Businesses as well as domestic conversations are frequently displayed publically, with an opportunity to be overheard. It is the duty of both the listener and the user to engage in an act of tacit privacy. The vocal sounds and ring tones now produces slight modifications of behavior as public response becomes necessary. Personal space is afforded to others through co present social moves. Callers protect their conversations (or data in mobile banking for instance) and choose the appropriate location to engage in device use. All of these factors combine to form a new form of social space. As Sadie Plant writes, 'the ability to handle mobile calls has become an important social skill.' (2002, 1)

b) Intensification of relationships between family members, when and where business is conducted, and even between strangers, happens because of intimate "personalizing" of telephony and public space. The display of privacy, the turning away, how the phone is held, can function as acts of flirtation with co present and in the manner that a cigarette, compact mirror, wristwatch, or pair of eyeglasses might become a device of erotic or sexual appeal. Increasing personalized behavior, meaning behavior that draws persons into proximal relations, occurring between strangers, with mobile technologies, expands upon trends towards increasingly informal social interaction patterns in new or unusual locations. Business, for example, can take place 'anywhere' but just so, private phone calls were to have taken place in enclosed spaces until the mid 1990s. These trends may have started with the personal computer and have, certainly, escalated with growing laptop use. Lines between "personal" and "work" communications blur exponentially with the

transition to pervasive wireless. New modes of address and reframed boundaries perceived as "flexibility". 'Mobile workers…account for an increasing share of today's labor force.' (Castells et al, 2007: 79) Business behavior appears to be similar to personal behavior. 'In many cases, co-workers call each other at the end of the day using the mobile phone in order to offer social support and avoid feelings of isolation…' (Perr et al 2001; O'Hara et al 2002 and Salvadore 2002 in Castells et al 2007: 80) Greater informality in dress and manner has become acceptable among working people in non-workplace spaces. Work is often conducted on one's own time The ultimate purveyor of wireless, thus, in the flexible economy and its marketing, is, thus, represented in the concept of the flexible worker, for whom self–employment and self-marketing, and/or working for a firm as part of a coordinated mobile workforce, is the ultimate way of life. Personal space for this subject is an extension of the body/location and, simultaneously, is a networked interplay between parties. herself and her company, or himself and users in other places.

c) Personal architecture

> …I am not Vitruvian man, enclosed within a single perfect circle, looking out at the world from my personal perspective coordinates and, simultaneously, providing the measure of all things. Nor am I…an autonomous, self-sufficient, biologically embodied subject encountering, objectifying, and responding… I construct, and I am constructed, in a mutually recursive process that continually engages my fluid, permeable boundaries and my endlessly ramifying networks… (2003, 39)

William J. Mitchell's public mobile user is embodied in the specter of the technologically -extended cyborg. For this figure, personal space includes layers: skin and clothing, architectural enclosure; and in the age of mobile devices, the 'electronic skin.' For Mitchell, personal space is refreshed and updated by electronic and networked mediation and this transformation creates new identity in the twenty-first century. Citing Gregory Bateson, he comments on the precarity of both personal space and identity. Boundaries may be elusive, ephemeral, and impregnable. 'We are not fully contained within our skins; our extended networks and fragmented habitats make us spatially and temporally indefinite…' (Mitchell 2003: 38) He also acknowledges the limitations of dependence upon electronic tools, writing: 'I don't directly control all the functions of the machines and devices I use; I rely on the intermediating machine intelligence embedded

in my cell phone, my car, my domestic appliances, the operating system of my laptop, and my software agents.' (2003: 35) Mitchell sees personal space in the context of cities as a nexus of boundaries, electronic tools, and overlapping networks, even offering a new urban metaphor of the 'mind city.'

> …as nodes of machine intelligence are distributed just about everywhere, and as electronic interconnectivity grows and electronic feedback loops multiply, cities are evolving into extended minds and biological brains are becoming elements of larger cognitive systems. (2003, 35)

This extended *mind city* design is one in which networks and the connected mobile device are conceived as one gigantic, flexible mechanism, both animal and cyborg, not unlike Eywa's organic network in the home tree in John Cameron's recent film, *Avatar.* (2009)

Small-scale focus, Wearability, and Personal Space

The seminal 'On the Mobile' study (Plant, 2001) points out the 'psychosexual dimension' to device owners' display of mobile phones. (2001, 2) Wearing the phone, she contends, concealed or 'out' are different gendered, culturally loaded approaches to carrying the instrument. Males are more likely to wear phones visibly, and to set them down openly on tables in a bar or restaurant, while females keep their phones in purses or pockets. (2001, 32) Some of these similarities and differences are summarized below.

	S.2 Summary of Personalizations Relevant to Mobile Culture
a)	**Decoration/symbolism** gives undeniable personal identity to mobile devices through the choice of case, screenie, jewelry, stickers, and other decoration of Blackberries, cell phones, the DS, DSi, iPhones, iPods, iPads, laptops, et al. This intimacy between owner and object; the informal, individual decoration of its exterior, customization of the screen and menus -- through dressing it up, making it fashion, naming it and other techniques, persists when mobile tools are carried on and warmed by the body and through the real or virtual connection of bodies to other bodies via networks. Communities branding their devices with meaningful sub cultural significations maintain a level of belonging, co-presence, and

	intimacy in this way.
b)	**Attachment of the tool to the body** effectively amounts to a cultural reassignment of the mobile body's relevance to communication. The body in transit, associated with spaces of transit, travel, and transition, for instance, waiting, is now a body that has gone from limited communications to being a powerful node in a network. The expectation of being able to reach and be reached is part of this physical reassignment/relocation of the body. Where at one time places could not be reached, it is now increasingly impossible to such spots without turning off the mobile device. Hjorth's interest in the minutiae of travel mediations and metaphors of travel in mobile culture suggests a second aspect of the physical reassignment when communications are attached to the body, a fact which otherwise has everything to do with the technology itself and how it works, node to node, with humans becoming nodes. Her analysis of travel suggests a miniaturization of processes which previously belonged to longer, more complex mobility trends, and which now, may linger in the aspect of mobility imbuing subjects when wireless.
c)	**The body-phone relationship exteriorized** as a private activity of making personal calls in public or by making public an array of computing activities, via iPhone or Blackberry device, for example, rearranges the space of techno culture mostly associated with domestic interiors and workplaces, such as emailing, gaming and surfing.
d)	**Interconnected bodies,** imagined as both mobile and networked, are an intimate articulation of social mobile culture, an imagined and experienced social space as it belongs to the connected. In America's "most reliable network", Verizon, the mobile device, visibly on the bodies of the workers, symbolizes workplace unity, much as Manuel Castells et al portray the phenomenon. (2007, 78-81) This sets a striking, labor-oriented example. Other images of interconnected bodies have also emerged. Architect Toyo Ito describes mobile usage among teenagers, as creating an 'augmented co-presence' that functions at the center of youth groups before, during and after their social events' (Ito 2003b in Castells et al 2004, 152). Mobile networking among teens supports the warm and fuzzy aspects of their events, the

	"togetherness", just as interconnectedness via open display and personalization of their phones demonstrates social and symbolic belief in the 'full time intimate community'. (Matsuda cited in Castells et al 2004, 152) While there is a loosening of communications from place, with respect to mobility, the body and tool are still one, experientially, enhanced by co-present aspects of the culture.
e)	**The mobile body's power to communicate** from 'anywhere' shifts emphasis upon place away from fixed spaces and into possible ones. Thus, mobile communication flows have as much complexity as the movement of an equipped individual through space and time. The messages and audiences a caller seeks to reach, the environments and events from which communication is made, create a traceable path of personal movement and the wireless 'Anywhere' exists as a veritable place from which to locate, map, record and re-navigate cities. In this context, the actual technological capacity of fluid access is paramount and the individual is empowered to shape communications through his/her network, language and engaged path of movement. In an early thread on nettime pertaining to cell phone culture, personal sense of place was described eloquently. > The need to stay in touch with the ones you're going to. The need to say you are arriving soon. The need to sustain at least a private network in a society that had almost completely demolished public space or made it anonymous space. (van den Boomen, 2000)

Meaning, Social and Emotional Effects of Cell phones

Plant's study of social habits in mobile telephony involved nine different cities around the world. In it she 'spots various types of mobile personalities and closely scrutinizes how mobile minds

work.' She is particularly insightful of the language and sound scape. She writes:

> All around the world, the mobile has become associated with a handful of phrases that recur like samples in a global dance track. These include 'on my way', 'on the bus', 'on the train', and other answers to a question that is now so common that it has come to define the mobile age: 'Where are you?' If this is the perfect mobile question, the perfect mobile answer is' on the mobile.' (Plant 2001, 29)

In Plant's study, mobile use entails social skills specific to the presence of mobile devices, almost exclusively cell phones, and those utilized in the presence of calls. She is interested in these areas of ubiquitous mobile culture, and their ambiguity and indeterminacy rather than in SMS or MMS or the local/global shape of mobile networks.

She argues that incoming calls can be 'disruptive, even arresting' and, utilizing material from "old tech", quotes Marshall McLuhan's observation on landline telephony that incoming calls 'provoke a sense of expectation, even urgency' implying that 'public use of the mobile spreads…tension to those …within earshot, leaving them powerless to intervene.' (2001, 30) She continues, there is a 'profound sense of melancholy associated with unanswered calls, especially when…in the wake of train crashes or natural disasters…' which overcomes listeners. Mitchell comments on this sorrow with respect to September 11, writing:

> I thought of the cell phone conversations that had continued until the very moment the World Trade Center towers collapsed, of the desperate calls from the cabins of hijacked airliners hurtling toward their targets, and of the pagers that had carried on transmitting from beneath the rubble. (2003, 2)

Thus, mobile telephony has an aura that is not simply a happy relation of convenience or speed. It also produces negative emotional effects due to the speed, distance, longing, and privatization induced by its presence. Ling articulates the role of mobiles in family coordination and young people's communities, discussing psychological effects of use and non-use; the 'remarkable

combination of social availability with intimacy' (Ling in Castells et al 2007: 152), the 'grappling between desiring to overcome distance and, the very force of desire…the actual inability to meet the object (closeness)'. (Ling 2004 in Hjorth 2005: 7) In the social reality of mobile boundaries, Plant observes: 'a ringing cell phone will often take precedence over the conversations it disrupts' and the cell phone 'tends to siphon concentration'. (Plant 2001, 30) She writes:

> Public makers and takers of calls tend to assume one of two bodily postures, both of which extend and reflect the broader observations about introverted and extroverted use. Those who adopt the speakeasy pose keep their necks upright, giving out an air of self-assurance and single-minded refusal of distraction by the outside world. This is an open and expansive position, confident and unapologetic. The space maker is rather more introverted and closed. The head is inclined… the whole body may be slightly leaning, as though towards the disembodied voice…Many mobile users seek out and improvise places of relaxation from which to make calls. (2001, 4-5)

For couples, 'its [the cell phone's] presence can be as powerful and distracting as that of a third person.' (2001, 1) Groups fall into two camps. 'Innies' treat the cell phone as an instrument 'smoothly integrated into processes of group interaction'. (2001:32) This group has a higher proportion of people with their mobiles on display.

> Often the phone is placed on the table as though to announce the owner's inclusion [of the object and potential for outside contact] in the group…it may be that a stake in the group is being claimed with this move…on receiving calls, these users are likely to maintain both the mobile conversation and the one in which they were engaged before the call. The mood…is generally sociable, chatty and playful. (2001:32)

'Outies' treat the phone as an 'outsider, and something which should not be given priority over the demands of those present.'(2001:33) Anthony Townsend writes of mobile phones that the relationship of owner to phone is one of contradiction. While it is a fashion accessory and seemingly easily replaceable for the owner, the cell phone is so intimately customized as to be

difficult to replace if lost, especially where the uniquely "inscribed" SIM chip is concerned. (2000, 6-7) Townsend observes a status relationship wherein 'what the telephone represents, more than the object itself' is important. (Townsend 2000, 6) He addresses its effects in terms of fashion. For instance, Cargo pants become popular 'as the extra pockets provided more room for …electronic accessories of everyday modern life.' (2006: 8) Artists have played with wearability in mobile communications and wireless transmission. Archi_media, a collaboration between the author and filmmaker David Cox, created a wireless transmission unit in 2002, entitled, *The Urban Strechnology Tool Kit*. The kit featured an ordinary fishing vest (with dozens of pockets) to be used for storing an imagined *excess* of desirable mobile tools, the world's smallest video camera, and other accoutrements of urban strechnology.

More on Intimacy and Mobile Culture

In the mobile era, proxemic analysis of space, arguably, has an arguably renewed significance. In every respect, both publically and residentially, mobile devices and networks shift boundaries of social interaction and lend new meaning to the concept of 'privacy.' 'Fluid boundary making' in Mitchell (2003, 7-9, 10, 19) and Hjorth's usage (2005, 2007) seems to imply variable subjective engagements within networks and data. In mobile culture, subjectivity is a 'space of flows' in which public and private 'selves' are played out. In terms of physical boundaries, this fluidity applies to the body and to the ease with which one moves through space as connected subjects. Geopolitical identities may vary widely in terms of their mobility. A person's physical mobility may be more fluid than another's based upon their legal or class status. In another sense, fluid boundaries are defined from within the minute, momentary interactions of networkability and portability of mobile tools, as well as through extension and protection of personal space. Locative navigation, deeper memory drives, increasingly hi-res video cameras in phone devices, faster bandwidth, and more widespread Wi-Fi create the fluid space of communications (interface) between users and cities. These fluid states, and the feelings of belonging involved with it, induce feelings of intimacy. This proximal intimacy with one's tools, passwords and interface, Hjorth argues, plays a significant role in the development of scale to personal communications. Representational acts of photographing and texting, for example, are intimate in

that both are 'light touches' upon incidents or events. (Hjorth 2005: 4)

The capacity to take and email a photo from an iPhone, Blackberry, DSi, or similar device, combines both intimacy and distance. The photograph is personal and local to its maker, but the network, the Internet, the mobile network (MMS) is longer: global, long distance, closing a gap. The email, or MMS, of the photo is, thus, personal correspondence, deliverable in seconds and temporarily, intimately, bridging that long distance between two parties. Multi-functioning as camera and as instrument of connectivity, the iPhone, advanced cell phone, or similar mobile device, creates conditions for small-scale social action, neither merely local, nor long distance, but continuously recombined. Long distance thus feels intimate, given that a 'co-presence' is formed in the gesture of the phone call and of sending the photo. Comparing MMS and SMS with sending a postcard, Hjorth writes: 'via these mediations, our intimates hold our hands in a co-present gesture of lightness that both reinforce their presence and absence simultaneously…' (2005: 4) In addition, intimates can be on the other side of the world, just as if they were next door, in terms of space-time relations. Esther Milne's work on telepresence, defined by her as 'the degree to which geographically dispersed agents experience a sense of physical and/or psychological proximity through the use of particular communication technology' (Milne in Hjorth 2005, 4) contributes much to this discussion.

S.3 Summary –Characteristics of 'Personal Space' in the Mobile Context	
1.	**Proximities of bodies** to one another in real time (Using Hall's demarcations from intimate to public)
2.	**Interplay between oneself and others** in real time and through network spatio- temporality. (The co-presence of long distance intimacy)
3.	**Impact of audio and visual elements** upon communications' space on individual screens or upon public space; images, ring tones, and sounds emanating from mobile device use.
4.	**Social behavioral expectations** or what Plant calls 'rules' (Plant 2001, 1-2) and their interiority and exteriority.

5.	**Spatial dependency, contingency upon having or occupying a numerical location** (Phone number, IP address, SIM chip)
6.	**Construction of identity** Recursive identity formation through networks, or what Mitchell calls "feedback loops" (2003, 32-4)

Differences in Mobile Ownership and Usage

Published statistics compare developing countries use of the mobile phone as a 'technological substitute for fixed lines.' (Castells et al 2007, 7) Statistics show that beginning in the mid 1990s mobile phones competed with landlines on a nearly 1:2 ratio across most cultures. (2007, 7) In some cultures, mobile phones were obtained because of economic need (2007, 7) and furthermore, on a widespread absence of landlines in these communities. Early studies of personal computing and Internet ownership and usage were not that dissimilar. Computer use was largely centered in privileged groups, particularly among wealthier, white men in urban areas enjoying good bandwidth, who procured these tools and their attendant research culture, first. Personal computers were dependent upon landline infrastructure, which has both been part of many poorer, developing nations communications culture. Poorer (and rural) populations have had comparatively less, if any, adequate digital access for this reason among others such as language differences, lack of identification with online content, and limited computer literacy or education. The rate of uptake of mobile telephony in the Third Word has been consistently more rapid than for formerly "new" computer-enabled network technologies, for which landline telephone wires were prerequisite. Uptake of mobile telephony in poorer countries is not, however, swifter per capita than in populations across all cultures and economic groups, only relative to uptake of landline telephones or personal computers. Landlines have required, in urban or rural areas, some established architecture in order to be installed. Initially, these would be located in a significant place –post office, school, and city hall—and were utilized, one per community. Cost of installation and upkeep of installation is generally higher than for mobile technologies. Mobile communications hardware, such as routers, antennae, etc. are smaller and less obtrusive to buildings, landscape and homes, although there are concerns over microwave radiation. On the

global stage, these devices are clearly simpler and easier to ship, if not to manufacturer, taking less material, and being infinitely smaller than personal computers. Chris Jordan's photographic series, *Intolerable Beauty*, expresses the nearly hysterical enthusiasm for exchanging and disposing of mobile phones in the USA. (http://www.chrisjordan.com/gallery/intolerable/#cellphones2)

Observed Differences between Landlines and Wireless Devices

Until the mid-1940s, domestic landline ownership in the United States was largely a function of wealth. Landlines would be collectively shared through apartment complexes in urban areas or were centrally located at the post offices of small towns. Mobile phones, on the other hand, have enabled some populations to own their own handsets and phone numbers, many for the first time. Examples are children, poor people, teens, and urban populations who rent or tend towards transience. The landline is arguably more technologically dependent upon stable architectures of place. They were fist installed in public spaces or used for business. Today, they are often an extra cost and hindrance when shifting apartments, when customers want to keep their phone numbers and not pay huge set up fees. However, rapid uptake of wireless devices is not simply about cellular, and physical characteristics of the cell phone, or the AT&T monopoly on Apple iPhone networks. Skype, for example, is essentially a wireless "phone call" made from a laptop. It is important here to be thinking about technological history and to reiterate specific differences from earlier computer networks and telephonic technologies. Mobile technologies differ in unexpected ways across cultures and subcultures. The large-scale insertion of wireless towers into global communications space 'frames a complex geopolitics and political economy.' (Mitchell 2003, 55) Secondly, the smaller scale of mobile devices, when viewed as industry products of all globalized cultures, not just the popular market audience, offer opportunities for unexplored study of their use. There is also lineage of public wireless networks and mobile gaming projects that utilize context aware media to develop social engagement in the context of ubiquitous networks and urban space. These projects are examined in detail further on. Finally, social uptake of any

technology is not bound merely to an acceptance and understanding of the tool, but rather to literacy in social network formation. This is essential if deeper modalities of mobile culture are to be expressed or explained.

Gendered Use

In terms of gendered use, Larissa Hjorth's work is particularly useful. In her study of Melbourne University students she evaluates presumed notions of "gender gap" in mobile use, stating, 'stereotypes about gender and technology were continuously contested within individual user's responses.' (Hjorth 2005, 7) Females she sampled were more 'curious about various applications' and more likely to customize than males. Females saw the phone as predominantly a communications tool, while males tended to see it as 'both a data/content transferring technology and a communications device' (2005, 7) Hjorth's emphasis on viewing the tool as a social instrument, finding out what it is used for and how that use is self described and by whom, begins to articulate space around the object for analysis. It is observed that females and males conceive of their cell phones on different terms. There appears, from the data, for instance, to be greater need among females for a communications tool while males have a greater practical orientation. Consciously or unconsciously, the subjects assume different roles in mobile communication. The study shows different requirements for how subjects feel about how that they "belong."

Context for technological activity thus frequently defines the social importance and status of the tools, or exactly what expectations are at play in its use and why networks are created. Context undoes notions of a 'universal' mobile culture and contributes to a more nuanced study of the technology. One finding on gender and gaming states:

> The usage of games on mobiles was overtly gendered --- none of the female respondents had ever played the games, in comparison to most of the male respondents who had not only played the games once, but did so regularly. (Hjorth 2005, 7)

These small-scale labor differences among university students constitute one gender gap. (2005, 8 – 11) Reasons are given for why females do not play mobile game applications as frequently as males do. Inequities and differences may speak more to game design than about wireless, or, if phrased in terms of time spent on the phone, might revolve around habits and interests, in terms of

quantity of time spent and how time was spent. These sorts of time differentials, because they involve labor, are undoubtedly defined by gender. What role communication plays in a particular group, and which economic, political, and social reasons are in effect, may determine why females require more time for calling, for instance, and why males desire (and find) more time *to game*.

A spectrum of meanings, in this context, then, lends complexity to ethnography of mobile urban social space and its mobile cultures.

More on Urban Culture and Differentiation(s)

It is common for customers in today's markets to opt out of the cost and inconvenience of landlines. Mobile communications add new "channels" to existing ones and intensify the capability for keeping in touch. Wireless, mobile technologies shift personal telecommunications with respect to what is individual, interconnected, and small-scale. In assessing this landscape, however, economic, political and social factors must be considered in any analysis of urban space and mobile usage. Race, gender, income, type of housing, unemployment, and degrees of education vary considerably among urban populations. These factors effect the perceived meaning and purpose of technologies, depending on what is obtained or not, or accomplished through them. In developing and non-Western cultures, these differences may become even more acute in contrast to prevailing industry presentations of 'mobile futures'.

In the future 'planet of slums', for instance, mega tracts of the worlds' urbanized poor, rapidly developing as urban "centers,"(Davis 2004) will be held together by cellular and wireless networks. These rudimentary, transitional shantytowns and tent cities, often without telephone lines to begin with, are open to the new infrastructure. Phone sharing and other cultural forms of use arising from social conditions, already exist within these urbanized areas. An entire group may use one cell phone. Similarly, emphasis in research studies on one-to-one communications or on voice-driven telephony that dominates western urban research tends to obscure creative and cooperative cell phone space. By adhering to SMS and MMS in her study, Hjorth's work, for

example, offers valuable insight for examining myriad possible functions and fantasy-related personal meanings for hand held devices.

Cultures of Social Use and Rise of the Wireless Internet

Mobile culture develops especially rapidly in urban areas where density and income support substantial sales and where professionalism is common and levels of education are a significant determinant. (Townsend 2000: 2; Losh 2003) Mobile technologies have also had, however, rapid uptake among the world's urban poor. These technologies offer much by way of communications infrastructure to developing nations. By comparison, landlines and the Internet are not well distributed:

> Overseas, particularly in developing countries, the use of cell phones is exploding while Internet use remains limited to the few and well-educated…cell phones are now appearing widely in the squatter communities that surround many third world cities, places where conventional wired phones have never existed… [And as Manuel Castells et al note] …while the specific patterns of mobile diffusion differ across geographic regions and social groups, it is clear that mobile technologies are [fast] becoming an integral part of people's everyday activities.' (Townsend 2000, 2; Castells et al 2007, 77)

William Mitchell also discussed the "real politik" of mobile culture and structural basis upon which mobile networks flow. He compares the process to 'water bottles, rechargeable batteries, and chamber pots---that expand the body's range from a fixed network connection point'. (Mitchell 2003: 47) He observes miniaturized technology in terms of its portability and as a history of profound access to contexts and spaces where a common resource is required and mobility is a desired option. Thus, the chamber pots are moveable toilets, water bottles are necessary carry able items, capable of quick refill at stationary drinking fountains, and rechargeable batteries allow users to stop and go, stop and go. Mitchell continues through the emergence of SIM chips and the wireless Internet. He writes:

> 'the start of cellular telephony happened in the mid- 1940s when 'Bell Labs developed the idea of distributing low-powered transmitters over wide areas' but 'commercial

cellular systems were not deployed until the late 1970s.' (2003: 48)

'By the early 2000s, systems were going digital and increasingly shifting their emphasis from …continuous person to person voice connections to …chip to chip data' (2003: 48)

Faster broadband erased distinctions between voice and data transmissions and 'we entered a world of GSM (Global System for Mobile communications) and G3, IEEE 802.11a and 802.11b LANs, the wireless Internet, Bluetooth and high-speed UWB (Ultra Wideband)'. (2003, 48) We have gone into G3, G4 now, with increasing speed in Wi-Fi, and wireless broadband.

> …wirelessly interconnected systems, components just need to be within range. If you add miniaturization and self-configuration capability…to wireless interconnectivity, networked systems become fluid and amorphous…the cumulative effect of this transformation is profound and will become so as wireless technology continues to develop and proliferate. (2003, 58)

Many early community wireless LANs worked around this principle.

•Melbourne Wireless' first utilized rooftop antennae with a one hundred meter range and wireless cards (running about sixty AUD) installed in individual laptops to extend the network. The combination of antennae and cards created network transmission from user to location, user and location and the network then "leapfrogged" (Toy Satellite Exhibition, 2004).

•SFLAN (San Francisco Local Area Network) relies on community-owned and shared antennae installed on high ground such as tall towers. (Bay Area Wireless Coalition, 2008).

Networked gadgets have evolved to become wearables 'attached to the body like watches' (Ling 2001; Fortunati and Manganelli 2002; Oksman and Rautianen 2002;Kasesmiemi 2003 in Castells et al 2004, 77) and 'quickly adopted…for a wide range of social practices, in addition to the main function of communication' (Harrington and Mayhew 2001; Varbanov 2002; Lachohee et al 2003 in Castells 2004, 77). Voice and text communication have been dominant. Where multiple applications now emerge as a result of multifunctioning in the iPhone, Blackberry or similar device, design and communications functions blur. Tracking everything from menstrual cycles to

constellations and sports scores, a wide range of information, interactivity, and networked mobility is available. The reconstituted, re-embodied wireless internet appeals, thus to diverse creative imaginations. In the design of clothing and kinesthetic wearables such as '*Urban Chamelon'* (2003) a responsive wireless skirt outfit by Fransisca Conway and Katherine Moriwaki, for example, or *Umbrella.net* by Moriwaki and Jonas Bruckner-Cohen, published in the article, 'Umbrella Net: Exploring Coincidence in Ad Hoc Networks'. suggest social wirelessness in intimate, personal effects networks. Moriwaki has published with various collaborators on the 'social fashioning of networks'. (Czeglady 2004; ISEA 2004) To others, the wireless imagination takes up descriptions of cell phones as radios:

> Cell phones are not necessarily 'the telephone' either: The cell phone (known as the 'handy' in Central Europe) is actually more like radio – in the original sense of wireless communication - than telephone. Its direct ancestry is therefore closer to CB than to Ma Bell. In this sense radio returns - via the handy - to its un-programmed origins as a medium of one-to-one communication after 75 years of domination by the 'broadcasting' industry. (Adrian 2000)

Mobile Imaginaries and the Female Gender's Contribution

Ubiquitous computing enhanced by powerful portable devices can be viewed as a state of flexible, open communications space. Sadie Plant identified this space first as a 'sound scape', comparing mobile telephony ring tone sounds to birdcalls in a naturalistic metaphor. (Plant 2001, 29) Castells et al, Goggin, Hjorth, Kopomaa, Matsuda, Mitchell and Plant all emphasize display, intimacy, spatial freedom, self conscious boundary making and sociability in their studies of mobile culture.

But, mobile spatial freedom has also been explained in terms of urban loner/lurkers, the 'flaneur' or 'phoneur' (Robert Luke cited in Hjorth 2005, 2). Hjorth attributes some of the customization and zones of intimacy associated with telephony with fashion, dramas of infidelity, identity role-playing by owners, social "meet up" or personal dating services bought in the phone plan, and determining social mobile culture and so-called "gendered use". Hjorth's well argued intimacy

trope increases the device's significance away from practical tool to that of one possessing an aura as 'other', as mirror, as extension of emotional selfhood: 'the mediation of intimacy isn't just a product of technological intervention' but a conscious activity on the part of the user-as-producer. (Hjorth 2005, 11)

Small-scale correspondence mediums, Hjorth points out, have historically embellished both travel and mobility even that performed within short-range intervals. SMS, MMS, postcard and photo analogies suggest connection to an enriched history and culture of gender and mobility. Her emphasis upon these small-scale of mobile actions, and on the resonance and persistence of metaphors in her studies, sees female users conducting communication practices with both 'intimacy' and 'agency'. (2005, 11)

Finally, entertainment value for the 'wireless anywhere' space is already a considerable commodity. Applications, games, movies, music, news channels and pod casts are part of the "space" of the multi-functional gadget, which serves all media while also a pocket-sized "virtual mall" for new apps. To be sure mobile freedom of all kinds and colors drives the personal telecommunications landscape: 'As elements of daily routine, wireless technologies, especially the mobile phone, are perceived as essential instruments of contemporary life –'THE social glue'. (Castells et al 2007: 77; Hjorth 2005; 7)

Navigation and Social Media

Cities are challenging environments in terms of their navigation. They generally require geographic information in order to be effectively navigated and utilized in their complexity. They must have comprehensible ordering systems to create day-to-day memory and coherence. They can, likewise, be mapped in any number of possible permutations of the map. The larger the city, the more true this is. It is one of the most salient challenges of Davis' huge shanty towns and megacities where the specter of human chaos leaving huge numbers of already destitute people even more devastated looms large.

Landline communication has traditionally contributed to this need for navigation. Townsend argues that the original telephone is 'an inherently spatial technology; its sole function is to allow communication at a distance.' (Townsend 2000: 3) It also represents the end user's access to a distributed network. Kevin Lynch's famous study of urban space in which he lays out a 'typology of physical elements…used to navigate through cities…nodes, paths, and edges as descriptors of perceived urban form' (2000: 3-4) offers clues as to how cities are planned and the requirements of navigation. World Wide Web browsers, by name--Mosaic and Netscape Navigator---are metaphors implying which imply pieces, places and spaces; maps, naval and travel metaphors. The global-ness of the Web, its abundant information, its archives, databases, pages, search engines, sites supply multiple arenas of information gathering. Because finding useful information is essential to personal well-being it is one of the great benefits of Web surfing and site navigation has been key to website design. Customization of websites focuses on methods to participate, audibly, technically, visually. Bookmarks are kept, choices made, desktops customized. Optimized software, settings, colors, "screenies" and email signatures create further ownership of the medium. They are accumulations. Now the personalization of small tools and mobile networks allows this process of information gathering and personal accumulation to be done on the palm. The mobile device is the map. It is the connection to the GPS system, whereas phone apps are the essential mobile visual media, a way to sort the environment through various lenses and filters, point and click. They make sense of data, information, place, and world and they represent a shareware community originating in the practice of 'beaming'.

Location-based Media in Urban Spaces

Miniaturized circulation of data flow, data distribution, ubiquitous tools and networks help establish personal, local practices and relationships between architecture and networks.

Efforts to commercialize the street and the navigation of the city to 'guide you to scarce commodities…at dynamically varying locations' originally took the form of location-based advertising (Mitchell 2003, 145). A micro-broadcasting transmission range is capable of dispersing useful local information: art, community, maps, and history within a geographic local and clearly does not have to be commercial in form, hence locative media. The exclusionary

aspect of location-aware advertising, for users who are out of range, is one limitation. (2003, 146) Mitchell also points out that low-life business--drug dealing, pornography and prostitution--have exploited mobile networks in liminal and clandestine ways (2003, 146) Locative media can be quite 'virtual', in the sense of being free-floating: 'no where' and 'everywhere' at the same time.

As a locative practice, 'geotagging' allows users to mark their personal use of urban locations. One tags a meaningful place, organizes routes, or leaves anecdotal traces such as photographs and text in a map. This can be a private map or one shared publicly. One purpose of the London-based research group, Proboscis' project, *Urban Tapestries*, discussed below, was to generate publicly authored local history from within the ubiquitous urban landscape of devices and tools. Another short-range use for mobile telephony, cited by Mitchell, is what he calls the 'remobilization of services'. Emergency and medical services 'throughout the twentieth century grew and co-evolved with urban networks…' They have emerged as complex systems of 'monitoring and data collection nodes' in homes and at other points along institutional data paths. (2003, 149) This remobilization of services parallels Deleuze's sense of the reformation of hospitals and institutions providing public services and 'the regime of separation and control that has long been designed into schools, campuses and medical facilities'. (2003,150)

A debate in school systems in the United States is whether or not 'to banish personal wireless devices', since their use among young people is difficult to control and district wireless networks could be used to access pornography or communicate to personal friends at off-campus locations during school hours. (Notes of the author, 2005)

Locative media: Public Urban Projects

The remainder of this chapter is devoted to a brief critique of a short history of urban projects which utilize wireless media and new software design for social purposes of collaborative texting, data transfer, mapping, and notifying. The projects all exploit ubiquitous wirelessness as a platform for software designs created to support experience, navigation, and participation in

public space. These mobile projects are set up for public artwork and information and to help shape spatialized experience of cities through ubiquitous personal media. They all fall into the category of 'locative media' in that they utilize context-aware and/or location-based technologies in their delivery and interactive components. They are all, also navigational to some extent, thought what they navigate may not be conventional, or may produce conventionally conceived maps by newly-authored means. This section emphasizes possible electronic cartographies created to influence future readings of urban space, interface design and public authoring.

Public Locative Media Projects

Alert SF Notification System, San Francisco http://alertsf.com/index.php?CCheck=1 The citywide, *Alert SF,* is an emergency notification system using broadcast texting/bulk texting capacities of mobile wireless. *Alert SF* gives free alerts via texting or email, 24/7, on registered cell phone, iPhone, Blackberry, and pager accounts. *AlertSF* will send watches and warnings for "civil unrest" (Personal email to author), flooding, tornados, traffic conditions, tsunamis, water main bursts, as well as citywide post-disaster information. *Alert SF* fills information gaps in the security and safety of San Francisco in terms of urban disaster, travel or weather conditions. It is intended to reach its participants via email or mobile phone, thus it is a remobilized service, and is non-geographically specific with respect to access, but reports only on the city of San Francisco and its municipal district. (Since c. 2005)

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Amble Time, Media Lab Europe http://carolstrohecker.info/ProjectPages/ambletime.html is software conceived as a 'time sensitive map' (Donovan, B. et al 2004) or a means 'to augment physical spaces by providing context-specific information to mobile users walking through the city.' (Galloway 2004: 392) 'The city emerges as an embodied, spatio-temporal experience, as the traditional map is visually overlaid with information on particular places physically accessible within particular frames of time.' (2004: 392) The project explores location-based information and ad hoc networking in terms of how they can support interactive stories and participation, thus,

in local urban history. (Donovan, B. et al, 2004) Proximity to areas of consumption would be one outcome, as would the re-embodiment of the city through a spatio-temporal experience: 'The software draws bubbles around you showing everywhere that you could walk to and still get to your destination on time. You could click on various locations on the map and see what times the trains were running or see information about restaurants…' (Galloway 2004: 392) This project gives users the opportunity to engage with the city at the level of their own timetables and inserts them into places, as active participants in the city.

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Texting glances: **ambient interludes from the Dublin cityscape, Story Networks Group at Media Lab Europe/Networks and Telecommunications Research Group (NTRG) University of Dublin, Trinity College**

http://web.media.mit.edu/~cati/publications/textingglanceseNarrative03.pdf

The project is a system designed to activate 'waiting-place annotation through text and image.' (Galloway 2004: 395) 'Transient audience participants use SMS texting to evolve a visual story on a large display which is installed in a public space such as a bus or train station.' (Vaucelle et al 2003, 1). '*Texting Glances* utilizes everyday technology; a cell phone, to act upon the city'. (2003: 1) The system retrieves images from any picture database via simple short message phrases keyed in by the user. The personal phrasing allows the user to be creative and personal with their txt. (2003: 1) *Tracing Glances* is 'a network of sites' that would incorporate the 'moving audience' found waiting in transit systems. (Galloway 2003: 395) *Texting glances* makes use of boring time within the city to engage participants in storytelling about their urban space. 'The direct and instant relationship between SMS and images seems to be quite exciting, and fun.'(Vaucelle et al, 2003, 1) This project, rather than emphasizing use of time for "work" connects participation to active dwelling in and experience of transit, while focusing the mobile audience upon creative use of their time.

In both *Amble Tim*e and *Texting glances* public space is conceived as a place of particular cultural ritual, walking or waiting, and both exploit the fact that public space hybridizes as it intersects

with mobile networks. Handheld instruments now participate in the circulation and recirculation of images, audio, cinema and text. These projects point to how wireless media is a creative and communicative part of urban interaction. Users can see themselves in this intimate mobile act of self-replication: contributing to a map, locating each other, telling stories.

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Proboscis: Urban Tapestries **http://socialtapestries.net/** Proboscis is a London-based urban social research group that produces urban locative projects, research and publications. Urban Tapestries is their project which best explores mobile devices for public authoring and collection of social knowledge about shared small-scale activities in urban mobile life. It is a creative model for utilizing Internet and mobile platforms, combined with geographic information systems, socially, such that participants author the environment around them, and access the authored "results" of others'. Citing Mass Observation, a social research organization working from 1937 until 1960s, and revived again in 1981, Proboscis looks to them in terms of their social research methods, for instance, surveys, for use in their own work, as attempts to gain deep knowledge of London. One original outcome of Urban Tapestreis has been original software, which in turn has enabled London districts to build relationships via their inhabitants' participation in creating information, making stories, pictures, sound and video. The project provided basis for a series of engagements with actual communities (in social housing, schools and with users of public spaces) to play with public authoring in real time settings. Public authoring of urban spatialities is paramount to the re-embodiment of urban space. This effort, then, is not about location, per se, which belongs to the language and intention of coordinates, but about place. Mitchell writes:

> Before the emergence of large-scale networks, dwellings and workplaces were often intermingled in fine grained spatial patterns…the separation of noisy, polluted industrial zones from leafy garden suburbs, and their linkage by commuter transportation networks, became one of the great triumphs of enlightened urban planning. (Mitchell 2003, 151)

Wireless technologies link spaces together in a 'fine grained spatial pattern', or a 'network of sites', as found in *Texting Glances,* where urban stories trigger audience imagination from public locations. Geo tagging also allows dialogues to evolve. In *Urban Tapestries*, e-notes about places both virtual and real are posted in electronic space and mobile networks become public bulletin boards to read and exchange about the social space of the city. Less an emergency network than *AlertSF,* or a navigational "tool" as *Amble Time*, these two projects suggest the power of public electronic media as an art and history medium in public space. Other artists, namely Adrienne Jenik in her electronic cinema performance project, *SPECFLIC 2.6* utilizes the ubiquity of mobile devices to create audience participation in a specific artwork.

More on Locative Media and Architecture

'Wired networks produced fragmentation and recombination of familiar building types and urban patterns…a new degree of spatial indeterminacy' writes William J. Mitchell. (2003, 144). It is clear that wireless media make creative public space possible where fixed, though decentralized, computing cannot. Mobile networks detach users from pre-ordained locales, locations, and prescribed experience. They recombine personal communications into hybrid spaces. Both information and creative work become, mobile, imaginative and sustainable in these networks. However, mobilized work manifests with some spatial indeterminacy in the context of the flexible workplace. Mitchell adds:

> '...the emerging characteristic pattern of twenty-first century work is not that of telecommuting, as many futurists had once confidently predicted; it is that of the mobile worker who appropriates multiple, diverse sites as workplaces.' (2003, 153)

This statement characterizes the era of mobile work. The user is located in various environments. She is sometimes in a series of workplaces, wherever connectivity with a wireless laptop can be found or making small-scale moves about the house or office with her tools. She is also in spaces

of transit with her hand held device, parked in a café with laptop and phone, or doing "hands free" talking while mobile. All places thus become one space –mobile workplace-- contextualized through intersection of the working 'dividual's' networked mobility and the fact that connectivity is possible 'anywhere.' Such fluid, spatial indeterminacy levels some conventional hierarchies and demarcations of places noted more for the speed of their wireless and available power points, than for what they represent. McKenzie Wark's article 'The Cancer of Cell space', points out the social fact of their annoying disruptions to cinemas and symphonies, places which once represented the highest ideal of social fabric, which were initially challenged by the ubiquity of mobile phones and their noise, accidental or otherwise. (Wark 2000) More recently, signs are placed to remind us to turn off or turn down the ring tone. Nevertheless, the war chalker is also mobile worker, on the sidewalk, from a car, while sitting in the park. As Galloway and others have observed, wireless media may knit marginal, or overlooked, or underserved, or boring spaces into more meaningful spatial experience.

Proboscis' urban research assumes a certain level of intricate interestingness to the city and redresses the homogeneity and virtuality attributed by the mobile era to the city and its individuals. London, in *Urban Tapestries*, becomes a place embodied through storytelling by its inhabitants. Public access (inclusion) and emphasis upon social knowledge reconceives mobile networks as platforms from which personal history and political cultures emerge. *Urban Tapestries* also valorizes the urban experience of Londonites, carrying out the purpose of non electronic, more conventional public information systems: flyering, sign posting and wheat pasting---upon which populations have long exerted control, informed their publics and organized themselves into meaningful communities. Both Urban Tapestries and war chalking map urban wireless experience, marking activity and identity, in terms of publics and public space.

Conclusions

Across scholarship, there is a perceived disembodiment, therefore, disempowerment of populations of cities. There is also a perceived re-embodiment and trend towards rendering

'location' and 'place' as data visualizations. Locations exist on coordinated maps, while places resonate with history and connote social space, interiority and exteriority.

Locative media remakes urban space, through its embodiment, retelling, public authorship, personal photography, and mapping. This contrasts with the official uses of GPS and GIS that suggest large military-industrial strength befitting Orwell's "Big Brother". Galloway's urban spatial discourse raises points about the state of cities enmeshed in wireless and the ubicomp context:

> …seen to comprise any number of mobile, wearable, distributed and context-aware computing applications… [This] may consist of research into 'how information technology can be diffused into everyday objects and settings, and to see how this can lead to new ways of supporting and enhancing people's lives.' (The Disappearing Computer Initiative in Galloway 2004, 388)

Because computers are increasingly context-aware, Galloway's concern is precisely that acknowledging the social control, surveillance and over commercialization of especially, the powerful influence of the United State's free market techno-society. She illustrates how it are that many public urban spaces, marginal and provisional at best, might be spaces of civic or creative engagement for their waiting, standing, and resting audiences, due to ubiquitous networks. Galloway's belief is that location-aware devices can better the experience of being public, augmenting urban spaces and advancing social space in cities.

Public projects presented in this Chapter underscore these ideas in their attempts to creatively redistributed participation and engagement. These significant directions in the design of public authoring tools, and the design of public space, mark a period of locative media in which research and creative development have sought urban contexts as platforms for wireless tools. They are, above all, attempts to redress Steve Mann's imbalance in 'smart environments.' (Mann, 1996)

Mobile media tools and networks, thus, work well in underused and unused spaces and places. Galloway's argument that the physical mosaic of public spaces can be made social and participatory due to ubiquitous devices, points to this exact feature of the new technologies: that

their inherent scale and flexibility makes them capable of reintroducing media to silent spaces of the city. In FRONT magazine, Vancouver, BC, artist Brittany Mitchell generated satellite images on Google Earth to map locations of green space in the city of Osaka, Japan, then printed them on large sheets of paper. (Front 2009) Her result was a visual map contrasting the random space with the intentional "park" and these with spaces, voids, and zones of green such as small plots, cemeteries and roof gardens. It gives a unique spatial reading of use and experience of the city akin to Galloway's suggested 'map' of marginal public spaces which could be brought into public experience through creative use of technology as something memorable, rather than grim. This might include elevators, parking lots, sidewalks, underground tunnels, or transport waiting areas.

Lastly, mobile art enables creative reinterpretations of place, multiple readings of spatial flows, and greater understanding of those flows, their data, or can develop the social input of populations of users. American theorist/artist Mark Pesce and Australian new media artist, John Tonkin's electronic artwork, *Blue States* (2006) tracks 3G Bluetooth activity as a set of larger and smaller blue dots, depending on strength of signal. The dots correspond to individual 3G and Bluetooth cell phone or mobile device signals and their locations. The result is real time data visualization moving within the 'anywhere' of an accumulation of mobile users. This work, and other locative media artworks like it, describe mobile realities and help interpret mobile urban space. Their data is often surprising, or fills in an imagined space for the audience, thereby, counteracting prevailing idealizations of the so-called mobile lifestyle, and its attendant forms of increasingly standardized connectivity and interaction.

CHAPTER 2

Gendered Use, Mobile Women, and Wireless Media

Introduction

When examining gender within critical mobile culture, there have been two distinct means for analyzing data. The first is a quantitative data analysis based upon global usage of wireless, across a variety of cultures, and especially including detailed, numerical statistics for commodity sales and/or purchase of mobile devices, especially the ubiquitous cell phone. This data reveals worldwide maps of male and female mobile commodity consumption and usage patterns. It is research in the form of readily updated statistics on the penetration of the instrument into global cultures, male and female ownership and usage globally, and data on the development of networks. Manuel Castells et al have produced some of the most comprehensive research in this area in the book, *Mobile Communications and Society* (2007). The other "voice" in the literature is focused upon anthropological observation, interviews, micro local, and sub cultural qualitative ethnographic analysis. This focus offers explicit uses and meanings for mobile media for males and females. These two different foci help to frame parameters for studying trends in gendered mobility. They have provided an analytical framework for my own original interview material and data gathered while at QUT.

This Chapter undertakes discussion of these two perspectives in an effort to define 'gendered use' as well as an explicit discussion of 'female user types' constructed from within mobile communications advertising. Dr. Melissa Gregg's critical commentary of labor in 'flexible utopia' (2008) and her analysis of idealized forms of "liberation" in commercial advertising is also cited.

Statistical Distinctions, Gender, Use, and 'Gendered Use'

Evaluated herein are two concepts: 'gender and use' and 'gendered use' as outlined by Castells et al in 'The Social Differentiation of Wireless Communications: Age, Gender, Ethnicity and Socio Economic Status' (2007). In this Chapter, Castells et al reveal extensive statistical gender,

technology, a comprehensive account of gender and use across numerous cultures. Useful distinctions are made in this work between ‘acquisition of the tool’ and ‘use of the tool’. Complex gender issues beyond mere ownership of the desired tool are made as are inquiries into specific sets of actions, associations, and cultural meanings for the articulation gender. These include behavior, comprehension, goals, and stylistic issues when it comes to mobile telephony. That said, quantitative data in the form of numbers of consumers and users, and based in gender, reflects how gender lines are already drawn in many societies and how mobile communications follow, or do not, these patterns. Moreover, it discusses similarities and differences in that data for landlines--the presumed technological precedent to mobile phones. Castells et als’ analysis is almost exclusively limited to voice communications and mobile phones. SMS or other types of mobile devices such as laptops are not generally included. The analysis is bounded thus to those identity-making practices associated with the role and function of voice and phone calls. Questions include which gender makes more calls and for what reasons, and what calls and phones represent to both males and females.

Defining Gender, Technology, and Contrasting Approaches

Anatomically and biologically speaking, gender is a genetically given attribute of the human body, a function of its biological ability in the reproductive capacity of the species, as well as a social construct that has little or nothing to do with biological difference. It is, rather, a set of ideas about femininity and masculinity imposed on humans through history, labor relations, and social mores with respect to their biology. This includes impositions such as fashion and clothing, beliefs about a gender’s inherent worth, abilities to perform certain tasks based upon sex, and deliberate historic exclusions from certain professions or activities. Secondly, from the standpoint of techno cultural history, where domestic appliances have affected females more than males, and more than "interesting" technology, all technology is inherently gender-biased. Access to diverse technologies, the ability to own and operate male-oriented technologies, and the social function of tools may influence communication in unforeseen ways in terms of gender, including

appropriation, customizing, and naming, since direct access to technologies, including the landline phone, is historically gender-biased. (Note: Landline telephones increased as a female technology over time.) For various reasons, including labor patterns, the idealization of housework, women's liberation and changes to labor and professional opportunities as a result of liberation, female relationships to technology have evolved. Housework, where limiting practical task-based emphasis into its use with appliances, for sewing, washing, typing, and word processing persisted has evolved substantially to include considerably more opportunities and types of technological knowledge for females. And, mobile media possess attributes which from the onset, it is argued here, make them readily available and less problematic in terms of use to females.

In many important respects cell phones mimic operations of landline telephony, thereby posing few fears or difficulties in the path of the user. They have the digital phone pad, handset (mostly), "ring" and have similar appeal as the historically "fashion-related" early portable phone culture: "decorator" colors, and personalized cases and jewelry add-ons, to customize their appearance. Additionally, it is argued, that because women have achieved greater freedom to move about on their own and in public space, since the nineteenth century, mobile phones are conceivably part of women's' liberation. They are, along with other portable computing and photographic digital tools, relatively light in weight, which helps women's' physical comfort and mobility. Larissa Hjorth's methodologies for the study of gender and mobile use emphasize intimate usage in the context of a specifically feminist historical relationship of self-identification and self-definition resonating in cultures of travel, mobility, flirtation and friendship. Constituting cultural anthropologies of mobile media use among women, they are of particular interest in this thesis.

Gendered use: Global Perspective

Castells et al identify three findings in their work on gender:

1. Clear gender differences arise in terms of acquisition and use
2. Some blurring of traditional gender lines in usage and/or observations of no gender differences are observed.

3. Culturally specific gendered usage patterns exist. (Castells 2007, 45)

Certain challenges arise when exploring aspects of gender and technological use. Technologies tend to be framed either in terms of how they 'liberate users from gender limitations' or how they reinforce and/or 'maintain traditional gender divisions.' (2007, 45) This split is criticized here for the attempt to neutralize technological use into one category or the other. It tends to obscure how agency determines the way gender works, or does not, show how gender affects internalized preconceptions users might have about how they utilize, or are supposed to utilize their technologies, or not. Hence, it is of paramount importance to study gender as a plausible space between liberation and gender divisions. It is essential that users speak on their own behalf, to *story tell,* especially in the context of identity. Self-description is essential. More nuanced understandings of gender arise when users define their subjectivity within the context of a study. In Hjorth's studies involving mobile culture among females in the Asia Pacific, usage involves strong regional and socio cultural difference that do not exist in Western culture. It would be absurd to apply certain Western ideas to Japanese females, or to ignore urban and rural differences or age differences. Different meanings may apply to the idea of liberation for women from different cultural backgrounds.

Multifunctionality, Gender and Use: Ethnographic Study

At the same time, hegemony persists in the so-called global culture. Regardless of the cultures investigated, Hjorth's research (Hjorth 2004; 2005; 2007, 2009) frames an analysis of the 'mobile device' as a multi-functional communications tool that expands considerably on the 'voice only' emphasis. Multi-functionality, engages with the premise that practices vary along lines of gendered use and may even indicate how gender is defined. Here, regional and micro-local mobile cultural studies focused on females express the vital, third observation of Castells et al--that identifiable, culturally specific gendered-use patterns offer rich possibilities for gender studies. A broader palette of meanings for gender and usage, apart from the insistence on the dominance of voice, for instance, in the adorning and decorating of mobile devices, its use as an identity-marker in subcultures or its capacity to be customized by users, are some of the practices

Hjorth's work explores. Specific use of the object articulates a more diversified understanding of identity making beyond:

a) professionalized, corporate business uses;

b) their assumed uses;

c) "gendered practice" as the demonstration of specific uses in calling or, for example, women's' sociality.

Hjorth's more numerous assignations of value in her qualitative studies offer nuanced readings from which gender can be redefined and even invented, moreover, for how mobile technologies might enable, or work into and upon, the formation of gendered identity and gendered roles. Her methods enrich comprehension of the domesticating function of the technology, as it may or may not push women into familiar gender roles, or expand upon their capacity to redress the limitations of those spaces through self-definition. Hjorth uses the example, for instance, of sexual intrigue as one area where women, especially married women, have more privacy when using their cell phones. (Hjorth 2005, 3) Hjorth's work on *kawaii* culture in Japan and Melbourne University students expresses these more broadly defined arenas for the play of gendered subjectivity and acknowledge the degree to which the cell phone advances female desires.

Observations on Uptake of Cell phones and Perception of the Tool

To situate my original research data, two other gender-based observations are that wireless technologies emanate from various international locations, not just North America or Europe, as personal computing did, and from Internet culture itself where major observable differences exist between personal computing and wireless technologies with respect to uptake and distribution. Absorption of mobile telephony is considerably more dispersed and more rapid in popularity than the personal computer and Internet were in most countries. Until the late eighties and early nineties, statistics regarding personal computing and the Internet were considerably higher in the North American and European continents than for other parts of the world. Mobile phones are

also less expensive, more familiar, and do not share the connotations imbuing computers with evil or elite science fiction overtones. Another perception of the cell phone phenomenon has been its status as part of yuppie entrepreneurialism of the mid 1990s (Kopomaa in Graham 2004, 268), associations through marketing with 'male fashion, power and virility' (Townsend 2000, 6) and ultimately with privilege and the business class. These perceptions are similar to those that have surrounded personal computer use, particularly laptops. However, much evidence suggests that they are dissipating as types of users diversify and cultures of use become more widely accepted and published. Kopomaa writes: 'One of the challenges of mobile phone companies was the yuppie image of mobile phones…manufacturers have worked hard to break down that image, the users, have through their choices, made the mobile phone into a popular tool.' (in Graham 2004, 268) In the US, 'gender differences tend to disappear as mobile penetration rates increase' (Castells et al 2007, 42) and with marketing directed at a variety of consumers and the publication of generous statistics on use by women, teens and minorities, classist notions of mobile use and individual desire as the dominant paradigm has dissipated. Some critical positioning, however, must be established with respect to gender and its social construction in statistical, analytical, qualitative or other findings. In particular two ideas require further elaboration:

1. How the mobile device is delineated as an object of use
2. To what degree the user defines the parameters of identity-making in the study

Gendered Use(s): Culturally Inscribed

Comparative studies of male and female use and ownership of cell phones made in Castells' literature show conceptions of social use within cultural and economic contexts. In briefly woven arguments, females are shown overall to be 'lower in income' than adult males and less likely to carry a phone paid for through their employment. (2007, 49-50) The discussion isolates types of usage that are statistically more common among females as examples of gendered use and demonstrates some ways in which males use technology and claim to find it important. Studies show, for example, women are more likely to acquire a phone for safety and security reasons (Scott et al, nd; Johnson 2003; Plant 2003a, Gergen 2005: IDC 2005: Lemish and Cohen 2005b in

Castells et al 2007, 45). Females are also 'more likely to use mobile phones for maintaining social networks and coordinating family activities' (Rakow and Navarro 1993; Ling 2002; Plant 2003a; Gergen 2005: Lemish and Cohen 2005b). Females in the United States 'reportedly make more personal calls: eighty percent for females and sixty-two percent for males' (citing Forbes 2005 in Castells et al 2007, 46) This social differentiation is visible across all countries:

> …women often have a central position in this activity…the use of the device, particularly for social communication can be seen as a pre-socialization of adolescent girls and their role as keepers of the social network.' (Ling 2002: 44 in Castells 2007, 46)

Gendered forms of labor, including social labor, exist in all cultures and are reinforced through use of the mobile phone. As far back as 1993, Rackow and Navarro observed:

> …cellular telephone technology may appear to provide a solution to two important problems faced by middle class, suburban women: the problem of safety and security in a violent, mobile society and the problem of carrying out family responsibilities across barriers of time and space.' (1993; 155 in Castells et al 2007, 46)

Rackow and Navarro concluded that use of mobile phones is 'likely to reproduce gender inequities…under the guise of problem solving.' (2007, 46) Another study, however, found that while males and females discussed the phone along traditional lines, 'activity and appropriation for men, and dependency and domesticity for women'…'examination of their practices showed limited differences.' (2007, 47) Lemish and Cohen suggest that mobile discourse may hold onto gender roles, while 'discrepancy between the conventional construction of gender in discourse about the mobile phone versus the actual practices associated with it that indicate a process of feminization' is apparent**.** (2007, 47). Their study produced little difference between males and females, quantitatively, in terms of how or why phones are used, but in the interview portion, males 'saw their phones as extensions of themselves without which they could not function…and regarded mere ownership of the device as a sign of social inclusion…. [while females] measured social inclusion by the number of calls they received.' (2007, 47) Similarly, gender in different cultures reflected some traditional role-playing with respect to the mobile phone and some non-

traditional elements for its symbolism or use. What appears in most studies is that mobile phones are generally regarded by males in more instrumental terms as a practical object for extroverted, outwardly directed use while females use their mobiles for community reinforcement, 'remote mothering', 'keeping in touch with' family and friends, and 'tracking' their loved ones, all in an era of increased mobility within the family. (2007, 46).

Other findings show that males generally consider technologies in terms of their usefulness while females first consider ease of use. (2007, 48) In terms of gender and landlines, Castells et al write: 'research in developed economies has long shown that women are heavy users of the domestic landline' having 'appropriated' a practice and supposedly masculine technology, for distinctively feminine ends' (Fischer 1988: 212 in Castells et al 2007, 45). It implies that socio economic conditions of females are largely the cause of this trend. They state: 'using the telephone enabled women to deal with isolation and to fulfill their socially prescribed role of network maintenance, as well as express their natural enjoyment of social interaction'. (Fischer 1988: 226 in Castells, 45) Their consistent finding is social use of mobile telephony is not gender neutral and mobile phone use for both genders challenges earlier perceptions of domestic landline use (Castells et all 2007, 45). Statistics from 1993 to 2000 in the US show females moving from second place in ownership of mobiles to that of having slightly higher numbers than males (Robbins and Turner 2002 in Castells, 43). That gap continues to close across populations in many nations including the United States, where an aura of business use of the cell phone may persist, with males found to be 'greater users of mobile phones with respect to actual talk time…' In 2003, they talked fourteen percent more than women did on their phones, but not, as demonstrated earlier, for personal calls. (Cingular Wireless 2003, in Castells et al 2007, 49). It has also been shown 'since 1999, that women are twenty-five percent less likely to talk unnecessarily on the mobile phone, and more likely to make calls out of necessity'. (O Connell 1999 in Castells et al, 49) Finally, male users felt that owning a cell phone made them socially included, whereas, females calibrated inclusion based on how many calls they received. Females also measured success by getting and trading phone numbers as often as possible and having an abundance of incoming calls. Males felt that simple ownership of the tool included them and made them feel accepted, successful and

social. In this context, females associate social communication with their identity while the tool operates as a symbol of social status among males,

More than Phone Calls

Gendered use of mobile networks and gendered identity-formation in cellular telephony is another critical perspective on the study of gender in mobile cultures. Cell phone calls, as the mainstay of mobile studies, limit definition of communication and may even prolong connections to traditionally gendered practices in mobile media studies. Much less is known, and remains to be understood, about texting and aspects of the cell phone interface, for example, than is known about cell phones. Arguably, as the culture continues to domesticate and recombine, gender-based meaning imbues all practices: voice to text, decoration, customization, social attitudes towards ownership and conceivable uses for mobile networks as much as resistance to gender-based meaning is also taking place. How these practices contribute to gendered meaning, blur and reinforce gender, or how they situate in feminist histories and operation for both genders, substantiates any complete understanding of the social fabric of mobile media. Phone calling alone has connections to long standing domestic gender relations in the home and to hierarchies in the office, while message-making, note-taking and the address book, have history for both men and women, but may seem, like gaming, more socially constructed to the advantage of one group or another. Beyond phone calling, writing/texting, customization, and symbolic signs of ownership such as pet naming, color choice, surface decoration, and "screenies", or enjoyment of certain applications, all have strong precedents as functions of female identity and even empowerment in both computer culture and fashion.

User-based Research: Advantage for Gender Studies

User-based research, wherein gender evolves through self-described construction of subjectivity, rather than either resting upon outmoded categorizations or blurring by limits on definitions of communication, is more viable because it valorizes self-identification and self-description. Female subjects speak their own desires/lives/communities and relationships to technology, pro or con. This would be a digital storytelling philosophy of ethnographic research and is anti-

deterministic in its viewpoint precisely because the specter of "use", in all its aspects, invariably lies outside market stereotypes deployed around "the woman user": "working mother" or "career woman". It is essential to the culture of feminism and communication, to know how females, not *ideas of females*, maneuver as self-defining agents, with respect to gender roles. Without this dimension to gender and technology, as feminist technologists Wacjman, Green, and others have illustrated in writings on domestication and technology, techno culture and gender is deeply under examined and fundamentally skewed in favor of masculinist history. Techno culture has historically excluded almost all women, save for stereotypical roles, and has relegated them to a largely subordinate end-user position when it comes to tools and hands on experience. At the same time, the industrial commoditization of technology uses women and their bodies to sell products from automobiles to toasters. However, this is not the argument here, per se. The point made is that expressive forms in technological use, such as writing and orality, are two arenas where women have historically been recognized for contributing. Thus, the creative history is an important critical departure point for the articulation of practices that involve skills, one or the other, and neither. Neither the technology nor its overt use, but the process of the transition to new technologies through expressive practices is an important locus of female contribution. As they intersect in cities, these forms of visible, verbal expression from women enable greater understanding of female mobile identity as a function of urban space. Recognizing their value fundamentally contributes to understanding the gendered social relations of technological development and its future.

Customization: The Object as 'Other/self', Decorating and Naming

Practices of phone calling, for example, exhibit gendered divisions of labor, or forms of labor with which both genders typically identify. However, as suggested earlier, 'phone call' only studies tend to limit definitions of mobile communications as a totality. Telecommunications history on landline telephones, their role in homes and among women users may, however, provide answers as to the popularity and literacy of the mobile phone among women, or why there is virtually no gender gap in cell phone ownership in most countries. Discussion of cell phones is not necessarily free of conventional constructions for gender roles. These roles may

draw attention to some uses and be obscured by others. For this reason, the best studies, where gender is concerned, expand upon voice communications as the central, and only, focus for telephonic use.

Customization suggests an important dimension to gender and wireless. Hjorth has pursued the study of mobile culture from this standpoint throughout the Asia Pacific and in Australian populations. She takes a highly nuanced approach to mobile culture with respect to forms of culture, identity making, and subjectivity and draws from multiple practices beyond or in conjunction with phone calling. Multiple practices, nearly unconscious in some cases, enable users to identify with their own brands, subcultures, and personal spheres of media and communications and to gain empowerment through this layered, creative identification. These elements form a mobile culture of communications wherein female users quite specifically define the specter of "gendered use", even when they may be responding to or resisting gender as a social construction simultaneously. For example, *'kawaii'*(cute) culture in Japan enables girls and young women a measure of empowerment for being 'cute' (Hjorth 2005; Castells et al 2007,51-52;160-61, Plant 44-5) fitting, as it were, into prescribed role-playing cultures for women and girls. This 'cute culture' permeates Japanese popular culture from fashion to music to media and, as suggested in Hopkins' study of 'girl power', gives young females a tremendously engrossing sense of belonging through identification with each other and the trend. The fascinating, portable 'tamogotchi' toy pets are an emblem of 'kawaii' culture; 'kawaii' stickers, games, small characters, cases, and other symbols are available in which to indulge and perfect a sense of belonging and ownership. SMS texting along with decorating practices, such as 'dangling characters off of one's phone' for purposes of display and identification are used widely in this culture. (Hjorth 2005, 5; Castells et al, 2007, 159-162; Townsend 2000, Plant 2001)

Hjorth's Study of Melbourne University Students

In Hjorth's interviews of Melbourne University undergraduates (2005), customization of the device, through the interface, or through original manipulation of its surface through decoration, figures prominently in the form of her questions. Participants were asked about all aspects of their

phones and their identity with respect to them. One female participant referred to her phone as her alter ego, remarking: 'its like playing dress ups' (Hjorth 2005, 8) a concept which has great resonance with traditionally feminine play culture and the role that dolls and make-believe have in the formation of female self-esteem. Users in her study attach meaning to personalizing the phone according to private fantasy life as well as public desire for sub cultural acceptance. In this context, the cell phone object is recognizably a symbol of self/identity, an object displaying cultural and personal symbols, as well as being a fetish item for the user. Among college students, females 'seemed much more attached to the customization modes [than did males], discussing the role of the phone as a 'diary' and 'a very important mode of every day communication and maintaining intimacy'. (2005, 7)

> 'Gender specifics were feature elements of discussions about customization', the researcher writes, 'with females tending to be more decisive and opinionated about their selections, often downloading different screensavers and ring tones rather than using the generic (and unsatisfying) ones…'(2005, 8)

Another participant stated that she 'spent much time personalizing her text messages...she was aware of the ways in which she was judged in public by her phones' attire.'(2005, 8) 'Females', Hjorth writes, were also 'more aware of the power of aural customization…most notably ring tones.' (2005, 9) Thus, in addition to the practical function of the phone for use in making calls, and the conventional idea that calls are for safety, security, "reaching out" or other, cell phone culture's capacity for personal display figures highly among women students who apparently enjoy playing with and changing the look and role of their devices.

Liberation and Mobility: Fantasies of Distance and Longing

Mobile devices, described in terms of *liberation* in the available literature and advertised images of mobile lifestyle, populate the imagination. This liberation is regarded as user empowerment and personal independence. (Hjorth 2007, 1) Opportunities created by mobile usage can develop

for female subjects, especially where living outside of domestic relations, including marriage and childcare, is concerned. Cell phones enable sexual intrigue through silent text and MMS, which resemble the exchanges of sexual mystique in exchanges of Victorian calling cards. (Hjorth 2005, 3) Observations on female independence in the context of communications via mobile device can be evaluated alongside the themes of co-presence and the persistent 'postal metaphor' in mobile culture to which Hjorth alludes. This position proceeds from feminist writing on conceptions of cyberspace and corporeality (Stone, 1994; Brook, 1999; Haraway, 1991; Hayles, 1999; Waldby, 2000; Nakamura, 2002 in Hjorth 2005, 4) and 'acknowledges the long history of telepresence in definitions of corporeality' in this tradition. (Milne 2004 in Hjorth 2005, 4) Greater mobility in daily communications and the possibility of mobile communications carries on psychological traditions in female travel culture and behaviors inherent in mobility as a pastime or function of profession. Hjorth cites both postcards and photography in her analysis of how communities of presence stay tuned through MMS.

> What MMS lacks in the significance of place…it makes up for in its emphasis on personalization…such a concurrent enhancement of mobility---from actual to electronic travel---is central to John Urry's discussion of co-presence. (Hjorth 2005, 3)

How wireless technologies function, then, for and through travel metaphors, may have other meanings. Western urban mobile cultures have nearly unencumbered communications power and the capacity to be co-present with it also called 'reliable network mobility' or 'seamless connectivity'. Communities of mobile users with the best bandwidth and communications tools are better equipped to reinforce themselves. This is visually supported through advertising rife with work, leisure, and travel metaphors that support mobile use in these contexts. Arguably, as all cultures become more westernized because of globalization, and as industries invade developing nations, westernizing global stereotypes act as emblems of hegemony much as Hollywood films have notoriously done. All cultures are thus involved with the daily use of cell phones for purposes of organizing and strategizing time and space, although on different terms. Notions of success and freedom, or liberation, through technologies, may be influenced in developing countries by globalizing mobile practices, just as access to the Internet has affected

traditional cultural space. Co-presence and mobile networks form the social virtuality, in which metaphors of distance, intimacy, loss and co-presence play a hand in disrupting other, perhaps more static, practices. This networked imaginary (rather than cell phone as object) is a form of micro travel, just as metaphors and symbols of place persistently associate wireless media with the physical world. Mobile place is, arguably, a consensual fantasy of everyday participation in the 24/7 'anywhere' of wireless technologies, which, in turn, involves feelings of co-presence, belonging, or the temporary, fleeting, momentary sense that one is in the same space as the person to whom one is speaking, sending and receiving text messages. An imaginary union between the two communicators, of 'being here and there', despite their distance, emerges and the use of messages become 'postcards' amidst these synchronous/asynchronous moments.

Travel and Female Subjects

The cultural imagination of travel does not exclude women, but, historically, the terms upon which women have been capable of mobility, within cities, nationally or globally, have been quite different from those of men. Disney's *Pirates of the Caribbean* (2007) includes a female lead dressing as a man in order to stow away in an all male environment. Hjorth considers travel and liberation to be Janus-faced; having overtones of oppression as well as "freedom". She cites flirting and dating as a means of social control of womens' bodies with respect to sexuality. (Hjorth 2005, 3) Within cities, micro mobility—enhanced through wireless communication and in which participants are both close and distanced in the imagination---operates as a form of travel in this sense. It is an idea about being somewhere one is not, while attaching physically and emotionally--- within urban communities. This micro narrative and micro temporality, and micro politics of 'self' demonstrates that what is 'presence in the telepresent politics of representation is' something that 'we do.' (Ito 1002, in Hjorth 2005, 4). And, arguably, this is a form of place-making in the ultra connected context of the city. Liberation via technology for women emerges, then, partially from female subjects' determinations to obtain independent lives and partially from their "real" interaction with urban space. Paige Edley has shown, about entrepreneurial American female parents, that they utilize cell phones for adult conversation and business while doing

childcare and have found that self-employment opportunities brought about by home computing and wireless technologies are very useful to their independence and personal freedom. (Edley 2004)

'Real' Females: Mobile Imagination in Advertisements

From a research standpoint, the popular landscape of images: advertising, commercials, movies, and television, show "types" of females engaged with mobile technology. These images generally express the ambitions and biases of the mobile communications industry and expectations within markets. Numerous assumptions about gender and gendered use are frequently at play in mobile communications advertisements. Stereotypes of females engaged in consumer and domestic roles abound, reinforcing familiar gender stereotypes through the categorizing of "femininity" and its normalized role in society. For instance, female types are routinely pictured at home, often alone, in their empty houses chatting on the phone about available media and its convenience, or listening to a male expert on the matter of their technology or connectivity. (Comcast voice mail and Internet ads, 2009) These are post feminist images. "Working mothers," "career women" and "liberated women" all appear regularly in mobile communications advertising, suggesting both the sweeping effect of second wave women's' movement towards equality, as well as a new era of roles for women in the mainstream, and their use in commoditization. Cultural imagination is influenced by these normative characterizations of female gender, and these types are created for new markets of mobile communications. Rubrics such as 'family and friends' which promote the idea of social networking as something done over the phone, within one's busy work and family life, reinforce notions of females as keepers of the family social network. These ideas engage both genders in newly liberated roles of personal community, family surveillance, (including monitoring of teens), family management, and social networking. However, research statistics indicate that females are more likely to see themselves in the role of caring for both the family and the social network. The 'two working parents' model (a middle class feminist ideal, arguably) includes multiple phone lines and payment plans making 'couple calling' attractive. Arguably, these industry strategies support the recent contemporary ideal of equivalence between the sexes

in domestic arrangements and family roles. They sell to the parenting "team" as a mechanism for staying organized or as a part of a lifestyle pattern that includes family duties, personal relationships and having and caring for children. Gregg points out, however, that ads featuring workingwomen in the context of a discussion of childcare and flexible work, 'routinely ignore the existence of house work and caring duties'. (Gregg 2008, 6) In fact, representations of workingwomen tend to isolate the woman within a dynamic of labor that excludes these two possible areas of her life. With respect to flexible family and the role of male parents, Gregg writes:

> In the rare instance of new media advertising, I [Gregg] have found which shows a man at home caring for a child, mobile technology provides the crucial bridge for bringing families together. ICTs allow workers the chance to confirm their affective bonds to the home when paid work can no longer guarantee physical presence. Mediated intimacy becomes a concrete and aspirational demonstration of longing for home, whether or not physical presence is actually desired. (2008, 6)

In other words, his role is also one enabled by mobile technologies, but, pitched largely as non-participation in the home, while also "connecting" to the household. In Gregg's argument, the labor of female housework and caring duties is still invisible. The issue revolves around effective representation of this labor. Gregg points out that language from a Toshiba advertisement has an implied broad acceptance of technologies for management needs among working parents:

> Workplace flexibility…is highly valued…specifically control over start and finish times in order to meet the …growing demands of family life' (2008, 15)

Toshiba's direct address of 'family time' and benefits of mobile technologies for management illustrates how markets shape and disseminate ideals of the working family, appealing to 'availability at least as an option, of permanent part time employment' for parents. (2008, 15) But, aside from these precarious labor issues, a picture of contemporary work styles comes clear: the family, its critical make up of parents and children, even its extended network into family and

friends, from a gendered perspective, is both a construction of the corporate marketplace and a social unit in valid transformation. Women's movements have altered roles emphasized in the traditional family unit from those of patriarchal household expectations to something other, where a woman's need to work for pay is recognized, household responsibilities are shared, and equality is based on more equal labor relations in parenting. The corporate model of family, however, speaks to a narrow social agenda, to what Gregg states is a neo-liberal agenda: that of a class of parent who can afford to work flexibly and for whom, presumably, networked jobs are accessible and available.

Mobile Females, Gender Imbalances and Casualization of Labor

The new post-women's' movement family comes about with the emergence of two female types: the "working mom" and the independent teenage daughter. Both are "mobile females" captivating the consumer audience with their goal-oriented desires. The family and friends motif for voice communications readily includes these two seminal figures, and all their girlfriends, as ideal consumers who reflect feminist social desire for power and presence "today." Casualizations and omissions of time and labor in advertising, Gregg argues, operate to the advantage of exploitative capitalist trends that favor casual work over long term jobs, job benefits, and job security, and are expressed within canons of flexibility and home workplaces. These casualizations, she argues, foster gross gender imbalances when it comes to the "real politik", then, of labor, while supporting ideas of new technologies as perfect for managing career and motherhood. They encourage avoidance of deeper societal needs such as national childcare in Australia, which would secure greater equality for women. She argues that responsibility of government to provide national childcare is slack, while the problem, and any outcomes, are whitewashed through flexible ideological positions in the industries. This issue is substantially greater in the United States where national medical care is only talked about and nearly impossibly to implement. A significant division, she comments, in women's labor issues is the mental labor of professional middle class women and the manual labor required for childcare, housework or silicon part making to support it. (2008, 7) Gill writes (2002 in Gregg 2008, 7) 'autonomous creative labor is seen to indicate a future workplace that is 'cool, creative and egalitarian', 'although actual

evidence shows this is hardly the case at present, especially for women.' (Pitts 2003, Terranova 2000, Walby 2000 in Gregg 2008, 7). The flexible work style promoted in terms of dress, condominiums, workplace space planning for older workers and workers of different sexes, is a chimera of techno enabled capitalist culture. Yet, despite advertising efforts to generalize mobile behavior into categories of 'cool, creative, and egalitarian', certain assumptions about mobility and flexibility in advertising supports inequalities that reinforce oppressive ideas in the representation of gender. Gregg gives more than a few examples, including those positing the female body as a central symbol of the new mobile freedom---a nearly inside-out appropriation of feminist iconography for the corporate imagination of work. When coupled with class or race and other factors, such as age (the absentees of the marketplace) such focus is particularly troubling. Female desire may be exploited in particular paradigms of work and not in others. For example, the presence of females in some professions or occupations may be either overly celebrated or virtually non-existent. The use of mobile tools by females in non-traditionally female professions, in construction or medicine, for instance, where women have made significant employment gains, are thus offered up as stereotypical examples of new women with real careers and real mobile phones. On the flipside is the widely known debilitating effect of global technology markets on women workers in the low-paid labor pools of Silicon Valley or the television manufacturing industry in Mexico, about whom numerous feminist scholars from Ann Barsamo to Coco Fusco, to Melissa Gregg and others have written.

Symbolic Representation of Flexible Freedom

Resurgence of the working mother type, beyond her role in family and friends packaging motifs with their emphasis on talk, turns up substantial tendencies towards post-feminist promotion of flexible work and mobile tools. Saliency of the imagery and language of advertisement to this promotion appears under the guise of appeals to feminist aspirations of career and motherhood, equality in family roles and equality in the workplace. Several facets of the working woman/mother body appear:

1. Working perceived as critical to self-actualization and psychological well being for females (mother or not)
2. Particular time management and psychological 'angst' for the working mother who desires career and motherhood
3. Strong connection between the laptop-wielding woman in a business career and her desire for equality with men (mother or not)
4. Female bodies coming to embody the freedom of and necessity for omnipresent networks and flexible workplaces (mother or not)

The working mother type that appears in advertising is emblematic of a largely mainstream conception of post baby boom feminism in which a generation of liberated professional women (aka feminists and career women) has had children, by choice, on the later side of life, while also enjoying the full benefits of a career. The icon of the working mother is thus ripe for critical evaluation in the study of gender. Firstly, she is the walking-talking example of a post-feminist ideal capable of balancing career and children. Secondly, she represents an intersection of female roles in contemporary society, epitomizing, thus, a multi-tasking, management oriented construction of identity in which the individual is responsible for his/her own time and its management. This is important because, in Gregg's critical framework, for example, the specter of the isolated female on whom the burden of management falls, precludes a larger portrait of real needs those women might require, such as nationalized childcare.

In the late 1980s, (Eastern seaboard, USA) Redbook magazine featured advertising on commuter trains between Stanford and New York City. The image was a woman in work attire *precariously* juggling groceries, a baby and a briefcase, the image of an individual who either manages *or not*. Arguably, this is an image/scenario rarely occupied by men, invariably seen as capable of performing all tasks without the introduction of doubt. (Again, however, devoid of labor issues connected to their achievement) The female pictured is one of the most difficult post-feminist types: the career woman *and* mother balancing family *and* work. Within western feminism the time-management struggle that mothers with careers face has often been

addressed. A quick search produces popular books on this topic, across several nations: *Mothers on the Fast Track: How a New Generation Can Balance Family and Careers* by Mary Ann Mason and Eve Mason Ekman (2007); *7 Myths of Working Mothers: Why Children and (Most) Careers Just Don't Mix* by Suzanne Venker (c. 2007); *42 Rules for Working Moms: Practical, Funny Advice for Achieving Work-Life Balance* by Laura Lowell; and in Australia *Double Shift: Working Mothers and Social Change in Australia*, (2005) edited by Patricia Grimshaw, John Murphy and Belinda Probert. In *When Mothers Work: Loving Our Children Without Sacrificing Our Selves* (1997), Joan K. Peters writes:

> …we must start with a better understanding of the psychological difficulties women face in trying to adapt to the social changes that they themselves have generated. (Peters 1997, 3)

Angela McRobbie [cited in Gregg] states:

> there are significant sections of the working population for whom work has become an important source for self-actualization, even freedom and independence. This includes women for whom work is an escape from traditional marriage and domesticity…(McRobbie 2002, 518; in Gregg 2008, 10)

The "equal" has also come about as a post-feminist type. Beyond simply selling the idea that working parents enjoy the value of flexibility as enabled by portable tools, is the idea that men and women are equal in the flexible workplace. Thus, the family unit and the workplace have transformed with respect to gender imbalances in parenting and work, and equality between the genders. The perception is that both men and women utilize their portable communications tools. Gregg writes of Telstra Corporation that it 'has been at the forefront of efforts to normalize the 'frequent flyer lifestyle' and the 'kinds of technology used required to facilitate it' (2008, 12) She argues, they have 'enshrined the laptop and mobile phone as compulsory companions of the successful businesswoman finally realizing her dream of equality in the workplace.' (2008, 12) She goes on to say 'the omnipresent network is promoted in the ad as delivering 'ultra

professional service'…'(2008, 12) Here she comments on ideas of the mobile office and, especially, the ultimate freedom and ultra professional service embodied in the signifier of a young, blonde female:

> Another 'young (once again blonde) employee in a down town coffee shop orchestrating a meeting with colleagues using her laptop…the slogan 'Telstra Flexible Networking. You Choose When and Where You Work' drew attention to the Wireless PC Pack which gave…options of choosing 'the most suitable workplace'…it seems increasingly less likely to be an actual office.' (2008,12)

'Young, blonde female' signifies the new freedom of choice (read: mobility) in work lifestyle. Blonde and young are characteristics of desirable age and race. Female, on the other hand, is in this scenario an idea of liberation, particularly from the office embodied by a young, good looking female, "limitless" and wireless. Other examples drawn upon in Gregg's analysis show a female worker in a bikini holding a laptop. Gregg analyzes the woman's 'unique' individual autonomy' and 'personality' in relation to the portable mentality of flexibility'. Personality and flexibility represent the new freedom.

> computer balanced delicately in one hand, the other *defiantly* on hip, the choice of equipment, and the choice to 'work where you want' fits the worker's unique personality. The cutting edge of creativity and autonomy is embodied in her stance…the *'diversity'* of the 'new economy' workplace. (2008:13)

Mobility and desired freedom are synonymous with 'working anywhere you want', 'constant contactability' and the ever-present possibility of finding or expectation of having work. (2008:13) Ciphers of the mainstream corporate imagination these females appear liberated through the technology as a function of end user-ship and invisible social networks of employment. They appear to embody *diversity* as if one were choosing between blondes, brunettes, and red heads. Flexibility and 'anywhereness' are illusory and, from this perspective, become the idea of liberation itself. None of the so-called rewards in effect guarantee security, yet they are clearly promoted as the 'now' trend to success; a contradictory message. The ads

reinforce the idea that there could be work; that 'out there' is a flexible utopia equality, personal choices, and self-actualization precisely because the new technology affords it. This favored work style, or the stylization of work and the flexible utopia, is embodied in the good looks of the women and their abundant 'free' personalities. Nevertheless, just as important as the commercial sector's obsession with regulating and rendering the pursuit of happiness through an illusory object of work is the location of happiness through purchase. One emphasis is on representations of technology as a *problem solver* for the personal, individual management of family and work which addresses women who can afford to work part time, while normalizing their participation in other labor. These advertisements reflect interests in promoting work as something which can be limited to a few days a week, which does not require the charisma or complexity of face to face contact and/or work that is, typically, somewhat thankless. (2008, 15) Beyond these statements, such ideology may push women further into poverty believing that, by the ownership of the tool, they will become welcome or well paid participants in the abstract 'anywhere'.

Case study: Women Artists' in Mobile Careers

By contrast to the vagaries of commercial concepts of feminist freedom, feminist lifestyles which are less conventional and less mainstream than those suggested by advertising types, such as self-employment by design or artistic life, flexibility is critical to strategizing how to make work and make one's living. It is also essential to negotiating parenthood, working life and children. As cities become increasingly wireless in civic operations and experiences or one's flexible work life becomes increasingly global, this can be particularly true. With the above context in mind, the next section presents original interviews with women new media artists. The interviews indicate that mobile technologies are generally highly useful, if not indispensable to their careers. The women in my focus group were unusually adept at working with new media software's and understanding new technologies, and as interdisciplinary new media artists, aspired to considerable mobility. They were selected on this basis of their education and abilities. In some cases the subjects were working in fully itinerant, mobile careers and were completely dependent

upon mobile technologies for their livelihoods as a result. In total, eight females ranging in age from 35 to 48 were included in the study. Participants were culled from the 'faces' feminist listserv for professional female new media artists and academics. The identities of these women were as creative, aware, innovative feminist new media artists. The study was undertaken on my part to dispel the aura of association between male business careerism and mobile tools. It was also undertaken due to considerable curiosity about Wi-Fi availability in North American and European cities, and as I was not traveling, how participants would describe their wireless connectivity. Participants were selected as the embodiment of global artistic lifestyle and distributed networked mobility customary in contemporary new media art world production. They are all professionals from Australia, Europe, New Zealand, and North America.

The Subject Pool: Further Detail

Eight women participated in the study. All but two subjects in the group were parents. One had a young child of four years old and other subjects were parents to young adults. All participants had art and new media technology related careers, either teaching, performing, writing and filmmaking or some combination of these. All traveled considerably or, in two instances, on a continuous basis and for long periods of time. Their cultural background was Australian, European, North American and New Zealander. All were owners of portable technologies, including laptops, mobile phones and, in most cases, at least one separate digital camera (not installed in an else wise mobile device). They had acquired these items either with their own money or as part of a shared plan. One subject was very laptop-dependent, but had never owned a mobile phone. Curiously, she was also the artist who traveled most, and for the longest periods, away from home. All used their tools for creating, storing and presenting their art in addition to other practical uses, and all explained various reasons why new technologies were necessary to their careers. In most cases, the participants were willing to respond and did not hesitate to answer with enthusiasm about their work styles.

The Survey

Survey questions ranged from some initial demographic analysis--- choice of career, income bracket, household size and type to those more precisely involved with media ownership, use

patterns, comfort level with technologies, and working life. The intention of the survey was to gain some understanding of what their technological independence meant in terms of how they worked, owned and saw themselves. It was also to garner some information as to the specifics of traveling and working in mobile formats, what worked or did not, and how public space was or was not designed for wireless connectivity.

Response to Questions

Responses were made via the Internet and on a prescribed survey form. All participants were volunteers. They were also given a brief history of the research intentions of the overall thesis. This section focuses upon answers regarding specific equipment and its use:

Participant #3 used her laptop and camera primarily as 'storage medium when traveling'. (The survey took place in 2004 before the explosion of USB platforms.) Participant #1 said that because she was

> 'since nearly 2 years, technically homeless, living with hospitable agents' that her primary reason for obtaining a mobile phone when she already owned a laptop (survey question) was 'no permanent address, cell phone and email address are her only stable contact methods'

This participant also compared her laptop to a studio and had a cell phone as part of a Family Plan with two young adult sons in college.

Participant #4, a graduate student in New York City, responded by saying she:

> 'used her cell phone to let people know when she was running late' but that she also 'resented feeling that she was always working' and 'deliberately turned it off' so as to get privacy.' She also said that 'the laptop was critical for sitting in lectures' and the if she were to design a better space for portable tool use (a survey question)---it would be 'a chair with a fold out desk to rest the laptop… using her lap was uncomfortable, tended to overheat from the laptop and was not very ergonomic. At Columbia (where she is enrolled) many of the lecture halls are quite old and do not have enough power points (another survey question) for student use. Students thus 'take power strips with them, for

sharing the one or two outlets on their side' or 'use battery power.'

Participant #2, who works in experimental 'cyber performance using the Internet to bring remote performers together in live performance events' and doing 'professional writing and editing work on the Internet and project management' to 'earn enough to eat', had been 'on the road since January 2004 (survey taken in April-May of same year) and 'away from home more than I've been there'. [She is from New Zealand and her grown children live there.] She writes:

> In 1999, I bought my first laptop (Mac Powerbook 14400) and without a laptop it would not be possible for me to live the way I do. I combine my artistic work with the bits of paid work I can get as I travel around, usually my clients don't actually know where I am; we just do everything via email.

Participant #2 described her 'portable computing kit' as follows:

> An iBook (Blondie) with built in modem, Ethernet and airport (wireless) and CD burner. Last year I bought a 30 GB external hard drive (Frida) which has been really useful, both as additional space (Blondie only has 10GB) and as a back up. When I'm traveling I copy essential files to Frida and carry her separately from Blondie, so that if anything is lost or stolen, I should still have everything I need.

The other great portable purchase I made last year was a digital camera… apart from taking excellent photos and… movies… I also use it as a removable storage device, essential when traveling as I often need to transfer files to other computers to print or work on them and Blondie does not have a floppy drive… most computers can read the camera from the USB cable; Frida requires fire wire, which more computers have, but not all. The digital camera is much more portable than an SLR. It fits in my pocket.

On mobile phones and other tools, she made the following remarks:

> I don't have… an iPod (despite other Mac friends boating to me about how great they are) or a mobile phone. I've never owned a mobile phone and I reckon if I can get this far, doing what I do, without one---then why bother? It constantly amazes people.

Participant #3 framed her use of the mobile as 'limited considering what she could do with a newer model'. When asked, 'Do you see good reason to be able to connect to the net via a phone or laptop from public locations?' she responded by saying:

> Yes. My husband travels a lot and it is good that he can send emails from anywhere, usually airports to continue working but also to be constantly in touch with the family. I If I had a phone that could do that I think I would do it a lot, to email and connect to the web, and to send pics to people on the go, sms, etc.

This participant, a filmmaker and new media writer, had used mobile phones since 1995, much longer than the others, and had owned two different model Nokias. Her reason given for mobile phone ownership was primarily to keep in touch [connected] 'for work, family and friends' while moving or traveling. She also owned two laptops: one for 'daily life things' and the other almost exclusively for downloading images. On questions of portability, this same participant had a fair bit to say regarding her practice, particularly because she used one laptop mostly as a desktop device, even when traveling. For this reason she 'did not use wireless services much' and she explained that she had 'bought her second laptop because the warranty outside of Australia was better for international travel, than any other laptop or desktop model which would be more limited to a warrantee inside of Australia.' When asked how she felt about being able to carry around this gear and how it had most affected her life she responded by saying:

> Profoundly, for all the known/clichéd reasons and also for other reasons like: extension of body, connected to global roaming subjects, all/always in flux; being able to carry …cameras… which continually get smaller and better has affected my life, (btw often I take my laptop… just to download images, this was the case in… 2000 when I shot a lot of material on a digital still camera and didn't have much portable/camera drive space on the discs and was shooting a lot of movies, so was downloading every night… I now have my own camera with a lot of drive disc space but still if going to travel would essentially use the laptop for this purpose number one, then to do Internet as the second

use.

Other participants had greater mobility in mind for their equipment and public use, apart from taking it along when traveling. When asked how often laptops were actually carried, #1 replied: 'for certain events only, but I carry it constantly as I am homeless and shift locations very often' and that she used the laptop in public at the library, in the park, at clubs, and outdoors… not on a bus though' Her battery time was limited to 'less than an hour'. 'I can't use the battery,' she stated. Her public laptop usage included using other peoples' power points, and using Ethernet/Internet as well as wireless, both of which she found varied in terms of their availability 'depending on location.' In terms of cultural attitudes towards her laptop use, she found attitudes 'generous they let me plug in' but also, in some areas 'economic… I sit there and feel like I have to buy something.' This same respondent usually used 'cafes, but occasionally the mall… or a Starbucks…' She also said that 'informal labs were her favorite spaces to log in and she thought there should be more of them for public use… everything is shared.'

When asked about portability and how it has affected her, she responded by saying:

> [Carryable technology] made it possible to keep abreast of, and participate in, particular cultural and social/political communities despite rootlessness. Similarly, it has allowed me to attempt to maintain an art practice despite lack of stable location. Has been a kind of substitute for a studio (although, due to my lack of proficiency with programming and software and lack of accessible server space, it has only been an inadequate substitute).[it] has been essential to me, especially as people who move frequently (not just me) are less and less likely to have a land phone line.

Participant #2 discussed how she managed her connectivity while traveling:

> I keep an assortment of cables and plugs: Ethernet cable, a few different telephone cables and jack adaptors, a comprehensive collection of power adaptors, the special connector for plugging in a data projector or additional monitor…

#2 had used the Internet since 1994, when she bought her first laptop and 'before that had come into contact with it [the Internet] in a library'. She carries her laptop with her 'everyday' and uses

it often in public with a battery lasting ‘more than one hour’ or with available power points, and for connectivity with Ethernet/Internet. Both Ethernet and Internet, she found ‘varied’ when it came to their availability:

> For example many trains in the UK now have power points, but very few in Europe do. Sometimes you can find power points in airports but not always. Sometimes I have asked for power points in places like cafes and people react differently, sometimes fine, sometimes as if they think I am being out of order.

Cultural attitudes towards computing also ‘varied’ for her in other ways, but were ‘generally open’ towards public laptop use. About connectivity she stated:

> Generally, I’m able to get online via dial-up, Ethernet or wireless wherever I go. Occasionally I have difficulty but I think it’s due to the network I am trying to get into rather than my settings. More often than not, I can plug in, change the TCP/IP and I’m away. In some instances, I set up accounts with local providers, but more often, I borrow friends’ connections.

When responding as to how portability has affected her life she stated:

> Massively, everything I do happens through my laptop, my creative work (I use my laptop on stage), my travel planning, Internet banking, everything. I could not live this lifestyle without it.

Moreover, to the questions about being able to connect to the Internet via a phone or laptop in public spaces, she responded:

> Yes, I would like to be able to do this more and I dream of the day when there is free wireless Internet everywhere. I would use it in my art practice, and being a traveler it would be great if I knew I could get online easily all over the place, instead of having to arrange connections everywhere I go.

Interpretation of Findings

Industry-related advertising and literature tend to mainstream uses for mobile technologies into

prescribed categories and presupposed demographics largely based on economic class, that is, those capable of affording the tools and supporting stylistically trendy and popular lifestyle choices or characterizations. Industry literature supports individualism through peripherals like carry cases, ring tones, as well as lifestyles which are typical: career, family and romance. It is clear, however, that consumers vary widely and that their use of technologies and perceptions of themselves as users may vary. Even in a small sample such as mine, users described their tools' portability and reasons for ownership in relation to career and personal life, but also very much in terms of their own sensibilities and their unique social histories. Tools themselves do not possess much inherent differentiation. Rather, what makes mobile culture so interesting is the idiosyncratic application of the technology; how users and the widely different geographic circumstances, stories and fantasies owners have about their instruments, perceive it.

Some generalizations can be made regarding the sample as a whole and there are also some particulars which can be stated. Certain factors come into play as belonging to a meaningful set of assumptions about artists and their choice-making in mobility. The first factor regards the issue of cost, since travel and cost of technological use can vary country-to-country and place-to-place. That said, none of the participants utilized global roaming except one, who did so as a recipient of roaming calls coming from her husband whom she noted, had 'one of those phones and accounts' and it was paid for by his work. Castells et al in the context of a discussion about calls made from home or work, observe 'the tendency for men to have work related mobile phones for which their employers pay the bill' (2007, 50). She was the only subject who, herself, desired the capacity to do roaming. A second cost issue raised among participants was wireless use only where *free*, not necessarily where *available.* These patterns suggest meaningful variability, which has to do with income differentials in the economy of choice making by individual users. Moreover, it is essential to understanding another feature of the study, one that involves definitions of mobility. Mobility is broken down into two prevailing parts: one, *travel as mobility*, and two, *use of mobile technologies as mobility*. The former involves the sheer independence to go places, and the latter involves the micro-travel of maneuvering with mobile tools. In the latter definition, the micro maneuvering available through wireless tools and networks can be seen both to assist both the

former definition by way of myriad micro activities involved in travel and to make possible other certain types of creative new media art practice.

Tools and Uses: Laptops and Mobile Phones

From this study, it is deduced that subjects require the tools for their careers. Likewise, it is apparent that their careers have been created around demands for travel. A summary is below.

In the era of globalized, internationalized networked culture, mobility has become simpler and easier to accomplish no matter what the perceived reason. Subjects are thus characterized as having made their purchases of portable networkable tools because they perceive themselves to be working in a networked culture where networked mobility in the arts is essential The laptop, more than the mobile phone, was considered indispensable. Mobile telephones operated as an additional layer on the Internet. Mobile phones were considered to be the tool primarily utilized for connection with people, not for other artistic ends, where as the laptop was a storage device, an image making device, and stage tool as well as "bank" and connection to potential employment opportunities supporting travel. The participant who self-described as 'homeless' and 'couch surfing' while remaining in contact and connected, used her mobile phone as a social networking tool while her laptop was a miniaturized 'space': her studio.

Laptops

Laptops also bear other importance for a study of wireless mobility, public space and networks. These are the availability of power points, the need for carrying converters and cables, the availability of connectivity (wireless or Ethernet) and portability when considering usage in places other than a fixed location. Most of the findings indicate a general perceived variability across Western continents for Internet access, Ethernet, wireless, and even power points access. Most subjects used their laptops to work in a variety of public spaces from airports to libraries to malls to cafes or on passenger trains, and made decisions as to what kind of connectivity based on what their machines could do, the availability of the connection and the cost. Most participants enjoyed the condition of being able to work while traveling, thus the portable aspect of the machine. One distinguished between two laptops and their uses, shipping one laptop for desktop use and carrying the other with her when out.

The Mobile Phone

In all cases but one (the participant who had never owned a mobile phone and saw no reason to), close contact with family and friends while in transit was the first reason given for owning a mobile phone. Mothers in the group noted a slightly higher emphasis on communication with family and friends. The type of communications tool used when moving between global and local social networks vacillated between significant laptop use (global contact) and lesser mobile phone use (local contact). Participants preferred Internet use when requiring connectivity with their editors, family, clients and friends, while cell phones were useful for tying into local presence and local social networks. The contrast between these communications forms was particularly sharp when participants had just arrived in a new place or had the availability of fixed computers. Mobile phones, most useful within national domestic calling areas, became more useful over time in a new place while roaming (as shown above) was cited by only one participant, who lamented not having an already paid for roaming account. Finally, the one subject, who traveled most in the group and who traveled for the longest periods and distances, had never owned a mobile phone and did not see any reason to. She mentioned borrowing phones on occasion to make a local call, but, otherwise, her connectivity was based on the Internet and her resourcefulness in utilizing different methods to gain connectivity i.e. carrying various cables.

Conclusions

Subjects were conscious of the difference in public spaces in Europe and America with respect to connectivity. They indicated their dependency when traveling on sharing friends' connections. They also perceived wireless (in 2003-2004) as an emerging technology which if universal and free would save time with respect to finding connectivity and their capacity for flexibility. Only two had wirelessly enabled laptops or wireless cards for their laptop. Some had wireless cards for use in airports only. One participant had 'gotten wireless access from across the street on an unsecured network'. Cell phones were often perceived as their mobile, wireless tool while their laptop was discussed as a piece of additional luggage or as a 'studio.' Regarding use and notions

of gendered use, as discussed earlier and appearing within this study, calling patterns and tool ownership revealed some gender inequality with respect to 'roaming paid for by husband's work' (more likely for males) and with respect to the role of the female as an agent in a social network. Family and friends contact, it was felt, required their presence in the social network (even at a distance) and was a role perceived as an essential part of their daily social identity regardless of location, or it was something they needed to maintain. This does not mean that males do not feel or act the same way, in fact in the roaming context, the male partner used roaming to contact wife and son, but it does mean that these career women all felt it a necessary and beneficial aspect of the technology. This study did not compare their responses to those of men, but it should be noted that this use pattern fits with numerous findings in studies cited by Castells et al; that, for example, it is most important to females to be 'able to be reached.' In terms of Hjorth's expertise on customization as an identity-forming characteristic of mobile telephony, one participant named her gadgets and peripherals after famous female icons or artists: Frida, Blondie, etc. In this context the familiarity and gynopomorphism of the technology is about an endearing familiarity with the machine and an appropriation of the cultural space through the act of renaming. Lastly, the physical convenience of portable tools versus larger and more cumbersome tools, works to the advantage of most female bodies in careers where the carrying of equipment is necessary.

As far as any noticeable differences in female artists' need for portable tools versus male artists' need, the study would have to be undertaken with a much larger subject pool, and one divided by gender. Arguably, the global availability and relatively low cost of portable technologies (women tend to earn less than men across most cultures and disciplines) is a factor that *creates* parity, or even disparity (with females ahead), with respect to gender and ownership. Mobile phones, as Castells et al has shown, do not follow the same 'use of tool' numbers as do personal computers. Ownership is more widespread and has occurred more quickly for both genders, with slightly higher numbers of female than male owners in the US from 1993–2000. It has continued in this vein in a more recent TGI Global study from 2004. (Castells et al 2007, 42-3)

Personal technology ownership is a more commonly accepted idea in today's communities than

when personal computers first hit the market. While there still may be some public dominance that favors men in terms of display (Plant 2001, 29-34) what Castells et al refer to as 'flexible constructions of gender and mobile phone use', for example, may be more often at play depending upon the community studied (Castells et al 2007, 54) and are, arguably, under considered in research. That is to say, where traditional gender roles are no longer observed, gendered use patterns based on traditional roles are less significant. Female artists who enjoy their contemporary freedom also enjoy communities wherein they can exercise that freedom without judgment. A typical scenario is traveling while leaving a child at home; a situation that would have garnered considerably more criticism in the past than it does in contemporary society. Females now enjoy gaining mastery of technology. Their role as technological users and owners has, however, typically been evaluated against that of males, and this saw great disparities in their abilities and their access to technology teaching with regard to the personal computer. One key property of new technologies that they are infinitely networkable and have become established as part of the working world aids their adoption by both genders. However, this does not mean, as Gregg points out, that both genders have equal employment opportunities in the 'flexible utopia' or, in terms of women's artistic labor, equal roles in new media collaboration.

CHAPTER 3

Wireless Cities and Pervasive Networks

Introduction

This Chapter distinguishes critical directions regarding wireless media and its affects upon public and private urban spatial experience from the standpoint of the pervasiveness wireless. Starting from the premise that cities are recombinant in their technological change, an idea summarized by Stephen Graham in *The Cybercities Reader*, and analogies of 'layers' (Mitchell 2003) to describe the dynamic effects of wireless and mobile networks, Chapter 1 first analyzes the city as a space of collective layers, impacted by new technologies which alter space, time and architecture. Urban space, conceived in terms of positive and negative effects of specific aspects of mobile, wireless communications, develops new social conditions. In this context, cities, as places both of complex, fortressing operations through military influence, and as places in which machine-related aesthetics and demands for privacy are changing rapidly. As street, transport, commercial, and military surveillance become part of the urban fabric, movements for free, citywide Wi-Fi as a right to the city (Saitta in Friesinger et al 2010, 64-5) surveillance has quickly are worth examining as community-based resistance and as necessary cures for digital divides extant since the onset of personal computing.

Cities are collections of histories, some intentional, some unplanned and haphazard. As complex arenas created by human will, they are intricate combinations of building, information and data architecture, systems and the diverse inscriptions of heir populations. These layers of history grafted onto the city are simultaneously disintegrating, often leaving unfinished and partial projects, or clues, at least, to the past. Networks are no exception. The World Wide Web acts as an analogue, in many respects for the built environment and redevelopment of cities. Likewise,

communities and their social, economic and political expression come and go. In networked space, this social information is another overlay upon urban space, another means by which communities impact and communicate.

Speed and Time

In electronically networked space, communications technologies can change in value and effect rapidly. Laid out for use in one era and abandoned in another, twentieth century telecommunications networks, for example, have been frequently replaced or added onto by new better, faster, more popular and smaller technologies. This changeover to better tools often transforms human orientation towards time. The immediacy of the video medium is one example. The speed by which electronically based video images could be produced and exchanged radically altered the process which electronically-based video images could be produced and exchanged radically altered the flow of news production.

Capacity to Improve

What new technologies can do may also be very similar to a former technology. A single factor, such as cost or its ease of use may determine how rapidly one technology is able to replace another. With cables or the latest small storage media, for example, a new component may simply attach to, or work on behalf of, an older form. External hard drives adding peripheral storage to laptops, USBs helping relationships between different fixed machines, or the support of portable music, for example, or Internet transmission over land infrastructure slowly morphing into broadband and wireless to offer another. Another good example is the move toward central switching exchanges and reconfiguration through information message processors that has been slow and additive. (Sumrell and Varnelis 2007, 52-6)

Infrastructure

In the wireless era, broadcast towers (from the 1940s, 1950s and 1960s in the United States) and telecommunications objects such as telephone poles made from tree trunks, may well become obsolete. They may change radically in terms of function within the network--from transmitting

one kind of signal, to becoming a high altitude location for infinitely smaller, more energy efficient infrastructure: the powerful wireless antenna. In the micro Internet of things, where objects, devices, and small-scale appliances begin to network together, applications over hand held devices, or embedded into devices, will become increasingly available, including hacks of existing devices, and these applications will be capable of distributing sophisticated multi-media, radio, and HD images (in addition to voice and text) across minute spaces, or longer distances. The Internet of things of objects and handheld transmission devices is a miniature communications infrastructure; another layer to wireless urban space.

With infrastructures periodically 'upgraded', due to innovations, or as shifts in the handling and economy of telecommunications occur, the cumulative effects of these changes will insinuate themselves into urban space. For example, the arrival of wireless “hot “ districts where fiber optic cabling is being laid affecting several large city blocks. Wireless broadband adds to landline telephony, cable broadband, and television signal with its faster, more expedient technology and is increasingly, with multifunctioning first generation devices further integrates with broadcast. At the same time independent networks of Wi-Fi antennae and repeaters are distributed and installed across rooftops in lower income neighborhoods, filling in gaps and securing wireless for individual homes and businesses. All of these are examples of urban network and infrastructural change that has begun to occur since roughly c. 2000. The result is concentrated communications power across multiple means of access, including handheld tools, which has boosted land values, and encouraged pervasive implementation of the wireless future. (Notes of the author)

Urban Vulnerability

Wireless cities are emerging rapidly because of extensive changes in military technologies capable of blanketing, via GIS, regional tracts of land and geopolitical zones. This relationship between new technologies, military and urban planning is not new, yet produces new senses of vulnerability. A brief examination of the American Internet demonstrates just how historically “deep” the relationship is.

Internet and Militarism

Consolidated into a 'network of networks', the American Internet emerged (Sumrell and Varnelis 2007, 56) to protect systems of defense and military communications in the event of nuclear attack. This development had much to do with city planning and management. From the 1940s onwards, ‘to remove industry, and later management' from city centers as well as to interconnect cities and 'strategic points' across the globe was a goal. (2007, 51) Paul Baran, original conceptual thinker behind the Internet, developed concepts that led to its 'distributed communications' and development. It was intended to eradicate fears of widespread communications outages in the event of nuclear invasion. (2007, 53-6) Two points can be raised about this. One is that cities, herein, are viewed as centers of national and global importance as the loci of communications. Secondly, the attack on the World Trade Center and Pentagon were the first major test of the efficiency of the American Internet in a major disaster. Oddly enough, it was initially designed for a defensive situation. Strategic targeting of the World Trade Center illustrates the truth of the first point. The attack on the World Trade Center was, as a rogue act of war, a deliberate act of cultural sabotage, arguably, directed at the symbolic presence of the global economy, in the center of global capital, New York, in Superpower America. Government offices also occupied space in the WTC lower floors and a large radio antenna sprouted from the roof of the South Tower. The place was hardly “neutral.” Attacking the Pentagon was no less symbolic, and images of the damage quickly disappeared from American news, indicating how powerful they might be over time. Architecture's inextricable link to militarism is unavoidable, but it becomes more complex as we look at the arrival of electronic media and the development of certain strategies as a result.

Removing Threats

‘Urban dispersal' and the ‘Highway Building Act’, undertaken for reasons of broader global defense/telecommunications initiatives under Dwight Eisenhower c. 1954 (2007, 51), were undertaken to create conditions in which cities, as loci of defense, would soon disappear and the movement of military troops, equipment and goods could be quickly dispatched. (2007, 50)

Highways, not boulevards (see later section of Chapter on Haussmann and L'Enfante) were designed for transport. Cities no longer would contain vital military infrastructure in this way. It is abundantly clear from this that modern cities are vulnerable and play central roles in military defense planning. Historically, they are strategic locations for military troops, weapons storage and communications. Sumrell and Varnelis suggest a post urban state:

> If the dawn of the bourgeois era is marked by the development of the metropolis and the proliferation of objects, our own period begins with the emergence of the post urban realm and the economic dominance of immaterial production. Today the physical is secondary to systems of computation and communication. (2007, 50)

Immaterial production id based not in heavy materials and machines, but rather on ideas, data, “added value” and services, a suite of products that have come about in the electronic age. The “app” may be the most recent incarnation. Sophisticated satellite communications now power our hand held capacity to navigate, surf, and network; systems like GPS and GIS. Without getting in an airplane, information on the ground is viewable and useable, yet immaterial and abstract. Such 'distance viewing' can take the form of IP addresses or pictures of persons and buildings “on the ground.” What makes them immaterial is the fact that they rely upon coordinated information, satellite photography, and layers of GIS abstracted as data. These mapping and surveillance technologies, GPS, GIS and Global Navigation and Satellite Surveillance (GNSS, NAVSTAR GPS) and the Internet have been developed through military research. One example where surveillance is influencing activity upon the ground in a populated region is The Surveillance System of the Straits or Sistema Integrado de Vigilancia Exterior (SIVE). This system observes the Straits of Gibraltar, an historic and symbolic region for migration. (Colectiv Fadaiat 2004) SIVE extends surveillance across long distance and, in this geographical instance, assists in the supranational management of the Gibraltar micro region and its ancient practices of migration. With SIVE, informational power and control is dispersed across customary enclosures of legitimacy such as borders. While constructed as an internationally controlled ‘electronic wall’ for defense, SIVE has the dual function of reinforcing and managing a growing border economy.

Flows of goods, migration of bodies, migrant labor or what the Colectiv Fadaiat (fadaiat means "through spaces" in Arabic) describes as a 'the factory border' are also objects of its surveillance. (Fadaiat 2010) This political analysis suggests larger influences that surveillance technologies represent in terms of geopolitical military strategies, redistribution of geographies and/or development of economies into new 'bordered' territories involving several nations and new 'transit countries'. (2010)

Fortressing

The fortressing of cities, gating and bordering of districts and zones, and privatizing urban space, has been a prevalent form of urban design for over two decades. Mike Davis argues in 'Fortress Los Angeles: The Militarization of Urban Space' that 'the universal consequence of the crusade to secure the city is the destruction of public space.' (Davis in Sorkin, 1992) Fortification has its roots in ancient, medieval and renaissance architecture when castles, towns and cities were designed to defend against outside invasion. William J. Mitchell writes that starting with 'skins' and proceeding towards 'fortified city walls', humanity builds 'outer defensive encasements'. (Mitchell 2003, 7) The medieval city or defensive castle had series of concentric walls acting as territorial boundaries between two places—inside and outside-- similar to nuclear bunkers centuries later. This wall type, among the oldest, has demarcated territory, prevented intrusion, withstood siege bombardment nearly universally, and has created separation between townships, cities and nations. The concentric rings were high, with towers as lookouts upon the immediate and distant landscape. This system of defense, sometimes combined with moats at the periphery, formed a formidable system around the inner center. Medieval towns were designed around complex networks of circuitous, interior streets. (Sitte cited in Mitchell 2003, 29). These street networks counteracted intrusion and attack with their deliberately poor site lines. Remains of this architecture can be found across Europe. A particularly good example, for its clearly defensive construction, first as a town, then as a castle, and then as a prison, is The Tower of London, an eleventh century architecture it took two centuries to complete. The structure has now developed as a tourist attraction and museum (with modern security system). Another example is Palma

Nova, Italy has both a defensive outer wall and an urban plan focused upon connectivity (Mitchell 2003, 169). It was engineered with a periphery of 'star shaped fortifications' to protect the 'assets and sedentarized or fixed populations from… armies without'. The 'central piazza is surrounded by public buildings…the focus of the internal street network and the local hub'. (2003, 169) Advanced bastions and battlements, substantially thicker and 'denser' than earlier walls, and upon which guards and weapons stood make up the surrounding wall. (2003, 171) Finally, Pierre Charles L'Enfant's 1791 plan of Washington DC and George-Eugene Haussmann's (Baron von Haussmann's) design for Paris, commissioned by Emperor Napoleon III in the 1860s, planned both for militarism and the movement of goods within the city. Mitchell describes the boulevards as:

> Radiating, straight lines; rather than surprises, they provide continuous views of distant monuments, and instead of allowing for easy ambush, they are designed for efficient military surveillance…they are scaled up panoptic diagrams. (Mitchell 2003, 29)

As cities became more vulnerable to attack, they were repositories for weapons and soldiers in networks of armories…. [and]open public spaces have disappeared. (2003, 29) Forts and storage yards for supplies at their periphery and boulevards for the transport of armies, vehicles and parades appeared under Hausmanization. (Cohen in Cinar et al, 2007, 55-57) They were arranged to radiate from major public spaces, and like the plan of London' and Washington, set up an overall decentralization or 'stars and meshes' as a defense strategy. (Mitchell 2003, 174-5).This modern urban planning, requiring vistas and distance, brought about two considerable effects. One, it radically altered the concept of public space, merging open military parade ground and controlled, landscaped elements with what had been previously more public, common ground or park. Haussmann's grand boulevards destroyed the medieval networks of small Parisian streets and related urban activities such as 'waterway sociability' long the Seine.(2003, 154; Cohen in Cinar et al, 2007, 55-63) Two, such planning took place amidst other modernizations such as better communications and transport systems for distributed information.

Micro Infrastructure and Internets of Things

At the same time the sea of ubiquitous hand-held devices increasingly chipped with RFID and networked into an 'Internet of things' via the microwave transmission between them, creates networked communications power and continues the drama of decentralizing network power on a miniscule and unpredictable scale. Networks of 'in range' 3G or Bluetooth devices create effective close-range, small system communication through microwave radio and microwave repeater technology. This is a direct result of military defense initiatives implemented to counteract concerns about centralized networks; for example, continuous wire connections were vulnerable to enemy attack. (2007, 52) AT&T established the first American microwave line in 1947. Cellular and wireless technologies are not wire based in their point-to-point transmission and end use. They are wireless using 3G, 4G, Bluetooth, and Wi-Fi, but they do rely, somewhere and at some point, upon the installation of longer-range antennae (mobile phone “trees”, for example) and require physical networks of towers, receivers, repeaters and triangulation---to be successful as a physical network architecture.

Personal Nodes and Public Space

Nor does end-user connectivity stand-alone. It proceeds as a multi-layered, recombinant experience where various source ‘feeds’ are received simultaneously, responded to in random order, and sent to different locations within individual personal communications systems from the cell phone to (now 20 year old) websites. Communication, in this context, arises within a networked experience as 'bubble', 'hub' or 'node'. Multiple mobile identities and myriad electronic messages intersect within complex, multiple sources: cell phones, Internet terminals, pagers, PDAs, and public screens. In real time, these sources, made ubiquitous through the presence of gadgets and installment of infrastructure, (Townsend 2002, 1-3) comprise an immaterial networked public space, what Wilken calls 'network mobility' and argues 'leads to significantly altered understandings of place and place-making.' (Wilken 2005)

Immaterial and Material Overlaps

Observations of the World Trade Center (WTC) disaster by William J. Mitchell evoke the specter

of resilient, flexible immaterial networks in the aftermath: 'cell phones heard in the rubble.' (Mitchell 2003, 2) There were also emergency networks:

> …mobile "cells on wheels" may be used for rapid disaster recover (these were much in evidence in Lower Manhattan in the day's following the WTC attacks), and there has been growing interest in the possibility of ad hoc, towerless cellular networks that are carried by mobile handsets---thus automatically follow users around and adjust for density. (2003, 51)

In the material and immaterial, urban infrastructure is comprised of:

> …. different types of networks... often functionally interdependent, failure of one type can produce failure of another. Telecommunications and electrical supply networks are particularly closely connected. Telecommunications devices require electric power, and power grids are managed by of sophisticated computerized telecommunications systems. (2003, 173)

Telephone landlines, circuitry; cables of all kinds, even building structures are the interwoven material, physical components of networked space. Their material reality becomes more apparent in a state of damage or catastrophe:

> ...overload conditions can cause progressive failure of network infrastructure…In an electric power network, for example burnout…can propagate excess loads to other parts of the network, which fail in turn…It is much the same with …progressive structural failures, like that of the WTC, where floors collapsed onto lower floors, which then became overloaded and collapse themselves… (2003, 172)

Mitchell evinces numerous other similar connections between layered networks, yielding, eventually, to the reassuring position that 'decentralized networks that increasingly dominate our globalized world have turned out to be remarkably resistant to random accidents and failures.' (2003, 175) Recent scholarship, however, characterizes aspects of their vulnerability in the modern city. (Sumrell and Varnelis 2007, Gandy 2004, University of Salford 2004) Network

development, unfortunately, necessarily resides in their defensive role in relation to war; that they would act as fail-safes and as complex systems of security, replacing other resources. Layers of electronic card readers, cameras, 'fences' and eyes, thus guard airports, commuter train systems, commercial complexes, malls and prisons; increasingly multi tiered high tech security and control is found throughout daily architectures and the architecture of cities. This militarization of urban space via electronic means, heightened during the War on Terror, overlays literature now on the fortressing of cities that we have seen in the recent past (Davis in Sorkin 1997, Boal, et al, 1997) In many instances of these systems, human labor is replaced and debates about automation arise. In the early 1990s, for example, AT&T lost approximately one thousand switchboard operators, most of them women and many of them who had worked at the company over twenty-years, when they downsized and 'went digital'. (Notes of the author.)

There are also other noteworthy narratives for implementation of wireless besides those evoked by Homeland Security and War on Terror narratives. For instance, in Queensland, Australia, Brisbane underwent certain transformations as a 'smart city' under the statewide 'smart state' initiative and ensuing supplies of capital. The 'smart state' branded Queensland as a place of knowledge making and innovation with wireless planning as a condition. The 'smart state' resonates with 'green city' initiatives in San Francisco, some of which dovetail with telecommunications debates and interests, especially where energy consumption and savings are concerned.

Building Information and Management Systems (BIMS)

Building Information Systems (BIS) and Building Management Systems (BMS) use computer networks to monitor structure, regulate air conditioning, thermal controls, or appropriate levels of oxygen, toxins and carbon monoxide for indoor air quality. These systems, increasingly designed into building envelope code requirements and those of mechanical systems, are becoming more common. Particularly for large buildings or complexes of buildings, reliant upon computerization to work effectively, they can make entire sets of systems automated. In 'smart buildings', the envelope is thought to become more intelligent, to become used to record time-dependent

fluctuations in weather, produce light, cooling/heating, even electricity for its inhabitants. Buildings are also rapidly becoming context-aware. This creates new roles for interior and exterior, for architectures relationship to environment and surrounding context, for buildings to be able to communicate with each other, and for the city to interact on larger and more complex, technological scales. An example of artistic effort in this direction would be the project, *The Future of Play*, an innovative collaboration between the Children's' Discovery Museum (CDM) in San Jose and the Rockwell Group's LAB at the 2010 Zero One Biennial, crated by Steve Dietz and Jamie Austin. In this art, technologically-enabled cooperative play through interaction at the CDM with wirelessly-enabled oversized foam blocks, was presented as a multicolored light visualization on the wall of San Jose's City Hall Plaza, located blocks away. (www.cdm.org)

In the wireless city, cellular and Wi-Fi networks, highly personalized in their range, overlap with the Internet, the web, fixed computing and programmable screens, automated or not. Cell phones connect with information systems. Medical centers, transport systems, schools, libraries, colleges and universities even small businesses now utilize the cell phone as a delivery platform. The overlaps in the mobile arena consists of cellular, free or limited pay for, or secured, Wi-Fi transmission and the myriad between end user device: the laptop, phone or PDA, and antennae and buildings, landlines or older telecommunications towers. Thus, a broad view of network history is one of multiple technologies grafted on and overlapping with, older forms and ideas of use over time. While some of these technologies have indeed emerged from military use and implementation, where there is huge research money in the United States, their civilian use, overtime, involves multiple other, creative purposes for the tools.

Automation and Surveillance

The future of GPS and GIS and wireless telecommunications now overlaying many urban areas, raises some significant concerns about the effects of automation, data gathering and surveillance on urban populations. For example, New York City's entire, municipal water system is moving towards being nearly entirely monitored by wireless sensors in a $250 million dollar effort to automate most of the monitoring and rate paying elements of monthly water usage. Benefits to the

NYC Water Department are that fees can be collected more efficiently and leaks found and repaired faster. (Chen 2009; Vos 2009) Customers may have the advantage of monitoring their own water usage via the computer screen, paying bills on line, and no interruption of residential activities by meter readers. (Notes of the author) Similar technologies are also demonstrating extreme usefulness for dry rural and suburban areas where wireless metering assists in water conservation as well as revenue collection. About the City of Akron, Ohio, Honeywell experts stated:

> The system will bring numerous benefits to the City such as virtually eliminating estimated billing, increasing usage data accuracy and reducing the need for City workers to access customers' homes. (Yenra, 2003; http://www.yenra.com/wireless-water-meters/)

The types of automation, suggested through these examples, are conceived as a cost-cutting replacement for human labor and as a shift of focus of what water system labor may be in the future. For example, instead of "in person" water metering, workers may be required to have skills in analysis of data. Widespread shifting of water system information to the customer, representing new customer-system relations, may tend to centralize some kinds of data and streamline others, while making home, office or personal mobile monitoring, just like mobile banking, into a new form of management and time consumption.

Wireless water monitoring across municipal areas allows area-based data about flow, usage and so forth to be collected for a variety of purposes. In the history of nineteenth century modern industrialized cities, new technologies were established for tabulating the census or installing electricity in homes (Marvin 1990). Today's trends towards utilizing wireless in public utility infrastructure and other urban systems, begs the question of whether or not twenty-first century cities will experience immaterial industrialization to such an extent that major shifts will take place in municipal and state-level organization. Again, the 'smart state' initiative of Queensland government in the early twenty-first century, included ramping up 'smart city' initiatives, and presumably pushing technological and telecommunications initiatives. 6,000 cameras distributed throughout the rail system in 2009 (Queensland) installed on trains and in stations are being

monitored by wireless technologies, an investment which *also* provides commuters with good bandwidth while in transit. (LeMay 2009) Cameras replace human labor for security and surveillance, and are, arguably, infinitely more capable of monitoring for safety through the computerized multi-eyed gaze and can have the secondary function of monitoring pedestrian flows as well. Likewise, perhaps as a sign of the industrial times, today's commuter workforce demands high speed 'anywhere' bandwidth. In all of these examples, the New York water system, the San Francisco water system, and the Queensland rail system, data gathering and monitoring of huge geographic areas is a newly operative way to control public space. As wireless technologies make urban systems less expensive to operate (labor reduced because automated) and more efficient (revenue collection) they bring about this extensive control. Wireless technology means smaller, more energy efficient, moveable and installable components. Older systems are thus improved, from the standpoint of the city or state government or municipal company, while changing conditions of public space create new opportunities for development and are felt on the ground by populations. Safety in wide open, or dark public spaces is a commonly held concern. Environmental data from GIS pattering offers scientists precise readings of land and water use, erosion, temperature and so forth, with which to combat climate change and estimate much needed conservation efforts. Spatial reorganization and design of land use benefits urban and regional planners. Wireless and satellite driven technologies are new information systems, ways to read concepts of geography, place, environment, and the human production of waste or consumption (even as market research). The potentials of this data and methodology have only just begun to be recognized.

Security Architecture

The space planning of swipe card systems, multiple locations for security cameras and biometric metering at points of defense in physical architecture is another form of electronic surveillance. Historically, the circulation of people, as Mitchell points out, is tied to systems of security guards, doorpersons, butlers and other service personnel reinforcing the spatial boundaries of interiors (private zones in offices and residences, for example). This chain of command is replaced or

augmented by electronic systems today, (Mitchell 2003, 8) standing in for monitoring duties once ascribed to human security labor. Biometric software such as iris, facial, and fingerprint recognition systems have been designed into airports and prisons ( ). Recognizing movement and/or human characteristic features, allows tracking of populations through secured or semi-secured space. Moreover, these systems exist within global communications networks and can be linked to policing databases. The rise in global, particularly cross-border mobility in the last twenty years, in addition to the post 911 War on Terror and American defense budget for hyping Homeland Security, has boosted global policing efforts and use of refined technologies for surveillance.

Other electronic systems serve to secure architectural boundaries and manage people-flow less dramatically. Card readers, electronic doorbells, motion sensor lighting all work to assist circulation through public and private space. Even in homes, security systems are able to scan locks or open doors and windows, through remote sensing or combinations of signals. Such systems also overlay public and private zones of buildings and building complexes in urban space. They most often involve sophisticated 'mapping', analysis and automation to control checkpoints, cameras, the opening and closing of doors and fire safety. Building Information Modeling systems monitor damage, fire potential and structural stress caused by seismic, water, wind, and other loads on materials and structure.

The regulatory architecture of networks--once roads and paths with gates and guards, or crossing points---has been replaced by new combinations of security labor, remote sensing, electronic messaging, biometrics and data systems which can monitor who and what is coming and going, the physical architecture and its systems, or individual identity, and increasingly, have also been networked to global databases.

Personal privacy

The ubiquitous presence of small-scale media lends itself to a growing surveillance of public space. As Mitchell writes, Orwellian surveillance models (Big Brother, 1984) have been 're-released' in widespread, miniaturized form.(2003: 27) Faster, newer, tinier networked surveillance

capacities, beyond closed-circuit TV, private domestic forums and the “panopticon” model have arrived.

Mitchell writes: 'he [Orwell’s Big Brother] is everywhere and all of us...at least when we pay attention...’ (2003, 26). In this scenario then, the critical question for personal identity and privacy regards spectatorship, in the sense, perhaps of Foucault's reading of the “gaze” and use of the term in feminist film scholarship from Laura Mulvey, Annette Kuhn and others. There are moments when one is not ‘on’ or ‘connected’; when the body is removed from control, gaze or audience, (2003, 26) and these are essential to social understanding of public space as it develops in the Mobile Age. Locations of surveillance cameras, what they look like, how and where they are mounted; use of cell phones in legal cases, for recording and documenting, or recognition, at least, of the potential to be recorded, seen, and heard, is increasingly part of our social awareness. A mapping of 'down time’ evinces moments of the private (not privatized) non-technologicalized body: the alone person (out from under any gaze), the ill person, the parent and child bonding relationship or sexually engaged bodies, are experiences, for instance, which cannot be calibrated on the same terms as “social” space. These are activities generally accomplished without technology or with intimacy and in non-disciplined spaces of the city: private homes, or the deep, non public access areas of institutions such as hospitals. Finally, the personal choice to ignore technology altogether, as when the telephone goes unanswered or when one shuts down the computer, is a boundary set to ensure one's privacy, personal space, time, or experience. Users viewing the cell phone as a ‘medium of control' tend not to own one. (Castells et al 2007, 47)

Surveillance and the Private “public”

By contrast to issues involving privacy of person, commercial culture tends to turn ‘human moments’ inside out and re-enact them as content for sale displayed through markets. Mobile phone plan advertising portrays hundreds of examples of fictional scenarios: families and friends, romance, partners, unknown, unreal persons engaged in domesticated conversation and the mass audience is daily encouraged to gaze into these false “private lives”. This is a form of surveillance onto fictional others and curiously, especially with mobile communications themes of “family and

friends" etc, depicts a less alienated, more "social" world.

Fear of surveillance emerges in culturally-specific ways with the phone camera. The sophistication, pervasiveness, and proximity of mobile media feed moral panic about personal privacy. This has even manifested in bills introduced to United States Congress, such as the HR414 Camera Phone Predator Alert Act, which would require all camera-equipped phones and devices to have a beep alert whenever a photo was taken. (Open Congress, 2009, http://www.opencongress.org/bill/111-h414/news_blogs)

> When we pay attention to wireless communications, the power of place, the power to see and to extract data… is greater than ever before' (Mitchell 2003, 26–7)

"Big Brother" revisited

In *The Electronic Eye: The Rise of Surveillance Culture* (1994) David Lyon addresses Orwell's Big Brother metaphor, he also suggests, by contrast, that some forms of watching are caring acts of concern for others an idea reiterating Jane Jacob's gentle observations about urban streets and neighborhoods in *'The Life and Death of Great American Cities'* (Lyon 1994; Jacobs 1961). This caring argument would be supportive, it would seem, of video security systems on city buses, in parking lots and garages, in parks and on public street corners, an urban security practice which dates back at least two decades. Orwell's "Big Brother", the pervasive eye of government surveillance reaches deep into the daily life of today. It emerges when information on identity is collected from the rapidly evolving, ubiquitous, often insidious wireless and web-based systems. Centralized authorities often harness the reach of these systems. Made mobile, data becomes more available and at the same time more distanced from the site of the events, Mitchell writes, surveillance becomes even more dangerous. (2003, 28) Dispersed in this fashion into populations, possibly contributing to a loss of awareness and desensitizing of citizens towards its practices, 'corruption [of surveillance] can gain new power' (Deleuze 1988, 76). Both the myth of Weapons of Mass Destruction and the hunt for Osama Bin Laden bear resemblance to this pervasive dissolution "watching" into multiple hiding places. Media spin operates as social catalyst and fear-begetting, justifying expenditures for global policing and the extension of surveillance

beyond borders. In *Virtual Geographies,* (1994) Wark describes 'extension' as colonizing vectoral power. These recent events of the War on Terror epitomize his concept of a powerful global vector---American security angst (and its economy) that extends in all directions. Deleuze writes, 'the coils of the serpent are even more complex, than the burrows of the molehill [disciplinary society]'. (Deleuze 1988 in Graham 2004, 77) Surveillance systems thus support feelings of security in public spaces and there is consistent data to support that in the United States, at least, females own cell phones for reasons of safety (Castells et al 2007, 45)---but the act of surveillance is also, historically, a disturbing extension of powerful bureaucratic requirements of populations: counting, watching, control and security. The development of pattern recognition soft wares and advanced electronic security systems, as well as facial recognition software, RFID tags, retinal scanning and biometrics offer substantial grounds for such a critique.

Finally, marks of surveillance inscribed upon the human body shape our personal sense of being watched and of watching of others. (We are asked to report suspicious activity and unattended luggage.) Personal space, proxemics, become part of the parameters of mobile lifestyle. The cell phone assists our demarcation of self, to the surveillance of others. He remarks: 'the surveillance apparatus establishes the presumption of invisible, anonymous, unverifiable observation'. Quoting Foucault on the damaging effects of surveillance, he writes, surveillance is, 'permanent in its effects, even if discontinuous in its action.' 'We act as if…observed, even when we may not actually be...' he concludes. (2003, 27) The panopticon has splintered into many minute pieces just as capable, and infinitely more powerful and effective, than its former centralized Jeremy Bentham design. Cultures of surveillance may result in new ways of acting, recording, responding and, therefore, internalizing such urban experience.

Wireless Spatial Experience

A defining characteristic of the present era of urban space and a dramatic change to urban socio-technical relations in the last decades is the presence of ubiquitous connected fixed and mobile communications and their attendant space of flows. Urban public space is now infused with electronic message-making, dense layers of data-gathering computerized systems, and global

connectivity meshed together through the presence of wireless, mobile, cellular infrastructure to larger and 'other' networks such as the fixed, wired Internet, through electronic screens and card readers, and to the GPS satellite network. Urban spaces, literally laced with endless global media options, are thus impacted. One can successfully enjoy a palette of radio, for example, from any part of the world, as clear using a powerful mobile device such as the iPhone or Blackberry. The urban environment is thus quickly unfolding as one of diverse, fluid and omnipresent media culture, the more prevalent with incoming cloud computing and the more visually dynamic with 4G. High end choice in media diet is now a commodity for sale through the interface design of the most sophisticated instruments. A benefit of this miniaturized globalization is that it assists in collapsing distant geographic separations into experiences of an intimate co-presence (Hjorth 2007; 2005). Applications for iPhones and Blackberries and other similar devices allow a stellar array of micro-management facilities in the palm of one's hand, including gaining access to a huge range of international news text and radio from the local to the national. Electronic media has taken a substantial turn for the diverse in the era of smart, small-scale, mobile media and in these transformations, three areas of the wireless experience lend historic depth to the arrival of mobile communications. The first is the 'disappearance of the machine' , the second is the idea of 'dis enclosed' space, and the third is 'extension' as a function of personal media empowerment in the shift towards mobile subjectivity.

Disappearance of the Machine

Each wireless citizen engages in the growing ubiquity of the electronic, urban interface. Success of mobile, omnipresent social media networks such as Twitter, for example, for all manner of activities from selling to gossip, is dependent upon ubiquitous bodies, networks and tools. Twitter is particularly interesting because as a social media tool, it all but eliminates differences between mobile devices through its democratic, text-based platform. Thus, an enormous quantity of communication can take place with the least amount of technology. This simplicity of platform and substantial use of the simple cell phone text messaging networks is but one trope of a larger subject that involves the machine disappearing all together, or the idea of ubicomp, from the work

of Mark Weiser. While Twitter, by no means utilizes context-aware devices, or even, sentience in its platform, Twitter presents users with an unusually high degree of immediacy in relation to social understanding of their circumstances. Hence, events which are Twittered are understood more readily and experienced more deeply, than without this omnipresent 'channel'. This is, arguably, a kind of context-awareness that arises from the repetition of information about a given event, location or idea.

Context-aware

Weiser was a research scientist at Xerox Park, Palo Alto in the 1980s. He died before much of his most theoretical and conceptual work could be realized, but his ideas exist as a powerful backdrop to the wireless urban conditions we experience today. Basically, he (with Seely Brown) predicted that the machine would disappear and, instead, environments would be chipped and embedded with computing devices, or what they also called 'calm' technology; intelligent and sentient. 'Ubiquitous computing was meant to go beyond the machine – render it invisible---and privilege the social and material worlds', writes Anne Galloway. (2004, 387) In this circumstance, context-awareness would be more critical to experience, cognition, perception and application than the physical machine and machine intelligence; a newly immersive relationship with the body would become all pervasive and accessible through context-aware devices. Weiser's ideas have influenced many concepts of the human-machine interface and efforts to forge seamless relationships between motion, feeling, and computing. The highly inventive data glove, a form of virtual reality, was one early example. (Wikipedia 2009) The "data glove", a precursor to Wii, for example, allowed wireless control computing experience on screens via movements of the gloved hand. Wii creates a responsive environment, synchronizing bodies and computerized image/game action. Biosensors and motion sensors appear in architectural and interior environments to control lighting, security systems, heating controls, and other aspects of the built environment. 2009 MacArthur award recipient, Camille Utterback, whose algorithmically generated digital image paintings respond to the presence of viewers in the gallery, incorporates motion sensors to influence data generation, which in turn constructs the art, and suggests creative, decorative, and

experiential forms of data visualization possible with wireless, sensing devices. (Utterback 2009) 'Wireless fabrics', 'skins' and 'clothing' bring us even closer to ubicomp where it intersects with bodies and physical environments.

Locative

GPS applications are context-aware in the sense that one's location can be identified and one can locate others. Artists work with locative media to produce maps and context-aware narratives about urban space. Locative media establishes a critical, social and political role for devices enabled with this new technology and over which users have some control: the identification with and representation of urban space on their own terms. In 'Revising the Map: Modulated Mapping and the Spatial Interface' (2009) Jeremy Hight examines creative mapping made possible through new mobile technologies. He includes modulated mapping, intuitive mapping, maps as databases, textual and spatial fictions, re-contextualization and borders, as well as the 'geo-spatial net'. (Hight 2009) The apparatus of the map, argues Hight, is interchangeable with the idea of *a spatial net*. He writes 'the map itself is no longer to be static; mapping is not either…' and he goes on to list new directions in the field of mapping such as 'live information' or new maps, 'placing of fictions' into maps and the politics of borders. (Hight 2009; 3 – 5) This activity raises the question of how newly 'coordinated' spaces and maps will be used, by whom, and for whom, or, more critically, how new cartographies can develop the 'reading' of cities from cultural data, personal or political narrative and hidden information. *An Atlas of Radical Cartography,* a collaboration between ten artists, positions the map as 'inherently political' through essays and mapping projects on 'social issues from globalization to garbage; surveillance to extraordinary rendition; statelessness to visibility; deportation to migration.' (Mogel and Bhazat, 2009) Wireless mobile media thus infuses cities with options for fluid data collection and distribution. In this context, the mobility of the technology allows for activation of dead or unused spaces to become part of the urban fabric. Context-aware devices can both map and trigger stories or images and the map becomes expressive and collaborative. These new forms of mobile social media suggest revisions in the patterns of networks themselves. They may beget social, historical *mobile* flows and micro

local vectors, bringing about mobile cultures of even greater complexity than those we have, or can conceive of, today.

Aesthetic

Finally, there would be no discussion of the 'disappearance of the machine' without recourse to its aesthetic disappearance. Weiser foresaw the miniaturization of computing, after the first stage of the microchip. He foresaw, in many ways, the Internet of things as a possible reality where contexts and objects could "talk" to each other via short-wave transmission. But, in this shrinking of the machine, what he also prefigured was the loss of the machine aesthetic. This loss is visible in 'blobchitecture' and elements of the increasingly rounded post DOS interface design, including Aqua, the basis of the entire Mac OS evolution. (Wikipedia)

Moves away from machine-likeness have been part of Macintosh's user friendly narrative since its inception.

Aesthetically, the idea of the disappearance of the machine also relates to earlier argumentation around the material and immaterial quality of production and Varnelis and Sulleman's proclamation that our cities are now more based in the latter. The iPad is ultimately the closest thing visually to not being a machine. The iPad's design removes user from machine-like interaction. The touch screen no longer relies on 'point and click', which, after all, reference push-button technology, even though, the mouse abstracted the keyboard years ago.

Discussion of Enclosure and its Loss

As a working idea, loss of enclosure exists in the writings of Gilles Deleuze, specifically with respect to 'societies of control' in the 'Postscript on Societies of Control' (Deleuze 1987; 1992) an addendum to *'A Thousand Plateaus'* (with Felix Guattari) The text flows from Michel Foucault's critique of architecture and discipline (1985). Foucault initiated discourse in which Jeremy Bentham's plan for a panoptical prison, wherein the warden can see all, has presided as the dominant image of 'enclosure.' The term 'enclosure' describes conditions of disciplinary social and economic power enabling the nineteenth century European societies to perform. The

invention of the factory and the creation of counting machines, census taking and banking were part of trends towards accounting for populations, institutionalizing professions, and controlling social space. Victorian era residential design bears similarities to Bentham's prison. Shaped, enclosed rooms, and interior openings, particularly in walls of adjoining rooms, frame interior views. 'Loss of enclosure' however, is a shift away from Foucault's disciplinary society. Deleuze argues that loss of enclosure is the result of specific forces generated in the twentieth century such as the rise of new technologies and decentralization of control which manifest as an erosion of boundaries, identity, the workplace, the institution, and the transference of data. Wireless communications further this process through decentralization of control and re-location of communication on to the body. Identity and production disperse into flexible, mapped geographies from the personal and local to the national/regional and global/transnational.

Identity

Personal boundaries form a mobile architecture in relation to fixed and non-fixed networks, with each individual making access decisions, filtering out… releasing, expressing desire, exercising power, and defining his or her "borders". (Mitchell 2003, 9). With mobile media, specific personal points of intersection with physical architecture---such as utilizing codes in security systems, ATMs, or swipe cards in payment systems---shape proximal relationships between the holder of the identity and the interactive system. Interaction is tracked and visualized in multiple points, each with duration, and can be recorded thus into databases. Clothing, drapery, bedding and carpet are Mitchell's analogies for these electronic points, seen by him as a 'soft architecture', which acts as intermediary between interior/body to exterior, hard, physical architecture. He writes, 'successive artificial skins continually varying in number and character according to [one's] changing needs and circumstances' are used (2003, 8) and electronic boundaries similarly demarcate self and identity similarly. Networks, constantly logged in and out of, enable mediations: self and city; self and place; self and Internet or self and cell phone call. An effective boundary is 'dependent…upon combining sufficient capacity to attenuate flow with sufficient thickness.'(2003, 8) Examples would be turning one's back for purposes of privacy, locking one's

cell phone, utilizing a ‘password’ or ‘filter’. (Plant 2002 51-2) ‘Now you get access by typing in your password…’ (Mitchell 2003, 10,193). These points of access substitute for physical enclosure and replace certain body language, verbal responses, keys, human beings or relationships of location that have existed in previous, less electronic and more physical eras.

> …we are vigilant observers of our own crossing points; of our own intersections of networked space. We self-monitor as much as we are monitored and this self-monitoring process… (2003, 9-10)

The wireless affordances which enable customization, privatization and security of individual experience, can also be used to produce synchronized security within mobile networks, as in the example of employees sharing mobile networks within one company.

Plant’s analysis engages other layers of the experience. Postures, used in talking and telephoning, or issues of display, focus attention upon the body, how and to what degree urban space is impacted. A newly establishing [she was writing in 2000] layer of social observation in the behavioral patterns of self and other, among city dwellers, inscribes layers of public and private meaning on the body, while Mitchell describes the body and the city in terms of the individual and his/her connectivity when opened up by wireless. Utilizing a biological metaphor, he describes this mediating, wirelessly-communicating body in space:

> My reach extends indefinitely and interacts with the similarly extended reaches of others to produce a global system of transfer, actuation, sensing, and control. My biological body meshes with the city; the city itself has become not only the domain of my networked cognitive system, but also----and crucially----the spatial and material embodiment of that system. (2003, 19)

Practices of identity making and synchronous/a synchronous communication now permeate social spaces of the city which were previously zones of face to face, semi public and public space. Remote control of tools and infrastructure extends us to and through locations. Mitchell continues to describe the fully wireless person:

> …as a privileged post-modern urbanite, I can take advantage of the resulting vast accumulation of mechanical devices to apply machine power wherever and whenever I need it, with instruments ranging in size from microscope actuators to hand tools, appliances, vehicles, elevators and escalators, cranes, conveyor belts, to huge industrial plants. (2003, 21)

Mitchell also suggests that empowerment through personal boundaries happens when one wears a headset, looping audio back upon one's identity. Multiplied dispersed power or the power of many simultaneous networked 'selves' becomes one *self*, one's own self in this context. (2003, 26-7). The Sony Walkman was a portable feedback mechanism of this kind, used to separate the individual from environment.

Extension of Self

Global digital networks have expanded communications' "reach" by offering an accessible alternative to centrally-owned broadcast technologies, difficult to access and expensive to run. North American and European digital networks, initially dominated the direction and tenor of the Internet, or 'vectoral space' (Wark 1998) for these regions, over other regions. Today, this disparity has been more or less equalized by greater growth and development in Asia Pacific, Asia, South America and currently, Africa, essentially redressing global divides, particularly in areas of numbers of users, though there is still much work to be done in the third world. As of 2002, statistics on numbers of users in the Asia Pacific rivaled European and North American ownership/usage. (NAU 2009) Within this analysis, the concept of extension is both positive and negative. When meant as power emanating from already empowered power, global capital and western culture, for instance, extension can aid the colonizing influences of these cultures upon developing nations. Extension of dominant culture through the Internet contributes to globalizing, colonizing practices, such as cultural hegemony or erasure of identity. (Nakamura 2002; Wark 1994; Deleuze 1987) However, when extension is viewed as an affordance of new technologies, giving users inexpensively-achieved "reach" world-wide, then, extension aids a healthy global communications by increasing communications between cultures, hence the spread of ideas,

possibility to work, making of new relationships, and, ultimately, it reduces cultural isolation and invisibility. With electronic networks developing in previously unwired countries, greater participation in the global geography of communication is possible. This means that the political, economic, and social life of regions, cities, and communities, is received in an international arena and communications context and this means less dominance by one region over another, and greater global understanding of news and events.

Extension takes on a slightly different form in mobile communications. Global roaming is, for most people, cost prohibitive. While the Internet enables global "reach" fairly inexpensively, cellular and 3Gmobile communications do not without high costs for roaming in any communications context: Internet connection, voice or texting. Wi-Fi enabled smart phones, however, connect free of charge or inexpensively, to wireless networks, and with Skype can make no or low charge international calls. Therefore, the ubiquity of mobile devices for achieving international "reach" via telephone (roaming) and Internet access (connectivity) fall short when we look at the capacity to afford an international call without a Wi-Fi-enabled device. This unequal relation comes into clear focus, when added to it, is the fact that many cell phones are not Wi-Fi enabled. However, this may be changing as costs for smart phones fall and Wi-Fi networks become more available to compliment "pay for" networks. Given the current factors, including incomplete Wi-Fi coverage, mobile telephony, with exception of really short message texting, must be viewed as giving users "reach" but not for global networks. It also has limitations as a medium, within certain practices, namely advertising. According to a recent panel discussion produced by Advertising Age, 'Complexities of Mobile Phone Advertising' (2008), mobile communications reach is minuscule in comparison to broadcast media. Mobile advertising has best results when targeted to very specific parameters. (YouTube/AdAge 2008)

Hybrid Forms

Twitter.com, however, is a social media tool which extends the reach of online social networks to mobile phones in practices of micro blogging which themselves limit the amount of words that can be sent and is generally free. Twitter exploits the most ubiquitously owned mobile tool, the

cell phone and the ubiquity of the web. Through Twitter's extended power to cell phones, nearly immediate delivery of small 'bytes' of news, information and data internationally is possible. An immediate, aggregate phenomenon occurred, for example, with the death of Michael Jackson, in an exponential capacity as thousands upon thousands of celebrity fans around the world were tweeted simultaneously.

Extension takes on one other meaning to contribute to this Chapter. This is its connotations and meaning at the level of personal communications, regardless of its technological "reach" and that is the connotation of extension as a form of assertiveness. When one asserts oneself into the world via a telephone call, the caller is extending his or her identity into space. Research studies have shown that male users, more frequently than females, describe their cell phones as enabling them to 'extend themselves' into their community**.** (Castells 2007, 47) Arguably, and this is an opinion, male users may more readily identify with the concept of extension, which conceivably involves moving to the exterior, while female users may not. It is also, arguably, a form of class dominance by a privileged group of owners/users or 'the yuppie factor' (Kopomaa, 2004) or is marketed as a sign of 'power and virility' (Katz 1999 in Townsend 2000, 6). In more recent years, with gaps closing along gender lines, or with female users exceeding male users in certain cultures, and with greater elaboration of the medium in cultures and societies at large, this perception is changing. (Kopomaa 2004) There is more work on 'gendered use' in Chapters 6 and 7.

With respect to dis-enclosure, then, extension of communications into global networked flows enables international communications, increases communication between places and cultures for better or worse, and is a boon to personal media empowerment and to the immediacy through which information can spread. As a function of massively available new technologies, extension assists in newly developed areas of "reach." With the onset of mobile devices and networks, Wi-Fi and other wireless capacities, communications and data retrieval, for example, within these zones is increasingly possible.

Sustaining the Public Commons

Discussion of issues and concerns in the wireless city of today would not be possible without

revisiting the concept of the public commons which has come under scrutiny once again as a feature of urban space rapidly in decline. In a recent, alternate mapping of 'enclosure', social historian, Iain Boal, argued that the commons---what 'we hold or believe to hold in common' as land and as the basis of one's livelihood and shelter, is all but disappearing as an historical idea under the reorganization of the form of capitalism and commercialization which has marked the last decade, after 911 and in the War on Terror. (Boal 2010)

In communications, the public commons (Katz 1994; Rheingold 1993; Kidd 2003, Rheingold 2004) is an idea about public networks, shared information and free use, a metaphor, borrowed from English farming communities and town planning and implemented in other urban spaces such as early New England American towns. Public commons, became in American towns, central squares: a place for marketing one's goods, free speech and political exchange and differ slightly from English commons which was less formally an idea about right to the land or land reserved for making a livelihood in common, as a shared idea. (Boal 2010) In communications culture, public commons has become the symbolic term for the collective imagination of cyberspace as a democratic set of ideas and networks or the digital commons, an allegedly neutral, democratic space, having less, historically with livelihood, as it does with forms of open discussion and exchange of ideas. Online communities such as The Well in Northern California were designed to be cyber places for the digital community –a virtual commons and were set up as a model for what digital freedom could possibly represent – civil discourse without commercialization.

The Global Commons after 911

Descriptions of the World Trade Center attack often focus upon the number of dead and the spectacular failure of the buildings, but from the perspective of public media and the global commons of the turn of the century, the event was also remarkable. The Internet and the World Wide Web made possible responsive communications within the global community, the posting of information about the dead and missing, immediate exchanges between friends and family, and made possible multiple sites for factual information including video and photos. Moreover,

however, given information and disinformation, the entire networked world could talk part in debriefing on the aftermath. From a public media perspective, this offered arenas to comment critically on global television and newspaper reportage and official commentary, while also enabling personal exchange. Thus, more diversified responses to the dominant American-made news coverage were possible, as well as discussion, commentary, and posting of facts and information over time as the situation unfolded. In and of itself, this citizens' news would likely not have been televised or radio broadcast in any – then – global context. For example, posts appeared on 'nettime' about artists either who had died in studios at the Towers, or who had lost their work. (Notes of the author) This was information for the global net time audience that might have been completely lost otherwise. The value of the post-critique is essential to the making of global events if we are going to have global community and a global commons, particularly where response to broadcast and the inclusion of word of mouth and unofficial eye-witness accounts can be 'heard.'

Electronic and Mobile Public Commons

The blogosphere, discussion lists, list-servs and social networking sites form an online electronic public commons of today, much as Dorothy Kidd, suggested that Indymedia's vast volunteer open publishing news network re-emergence of the 'public commons.' (Kidd, 2003 in McAughey and Ayers, 47-71) The shaping of networks into virtual public space/sphere/commons results in two prevalent social conditions: one is virtual co-presence, also found in mobile telephony, of being 'here' and 'there' simultaneously, and the other is extension, wherein messages are sent out to others in a broadcast mode, thereby extending the 'reach' of an individual or group. These two conditions create sense of community in networked space.

Increasingly, the online public commons is being intertwined and combined with a mobile wireless public commons of micro blogging, 'sharing' and other mobile tools attest and discussion of Twitter alludes to. Web-based technologies and mobile and smart platforms are increasingly merged, making instantaneous reporting, for example, very simple to do. However, properly defined, the in common aspect of these technologies lies more accurately with the

simultaneous presence of free Wi-Fi than it does with the juncture of online or mobile tools. If cities had free Wi-Fi for all and zero-degree digital divides, they would be closer to achieving truly inclusive public commons. Arguably, positioning of the public commons, with respect to new technologies, livelihood, information and civic participation, has everything to do with the kinds of public space possible to successfully network, not with the way that gadgets are perceived to "connect.' This positioning correlates to an abundance of privatization being pushed onto the life of public spaces. Privatization encroaches upon the use of public space through unbridled commercialization and surveillance, and, even, illegalizes aspects of their use. A new proposition in San Francisco-- that it is now illegal to sit or lie on the sidewalk between 7am and 11pm----obliterates open use of the sidewalk.

Co-presence and Belonging as a Mobile Experience

Examining 'co-presence' as synchronous and asynchronous communications in, for example, online communities (Wellman 1998-2001) or the dynamics of 'email', as Esther Milne has written about, takes us to the use of the term in cell phone social space. Co-presence amounts to imagining oneself somewhere else and where one is, at the same time. (Milne 2004; 2001) It contributes to the sense of being in a community through the psychological 'feeling' gained in co-present interaction---one of temporary belonging. This is intensified, Larissa Hjorth suggests, too, because mobile communications are increasingly taking place from "anywhere" and not within familiar private zones of work or home. Hjorth 2005**,** 1,2**)** Co-presence, she argues, allows participants and their communities to feel 'in the same space' even though they may be geographically at a distance, citing Michael Arnold's reference to Martin Heidegger's 'un-distance, (ent-fernen) or the abolishment of distance and nearness '(Arnold 2003a in Hjorth 2005, 2). Co-presence is to feel part of a temporary psychological enclosure, even if 'fleeting'. **(**2005, 3**)**. She also locates co-presence in Williams' and Ling's domestication discourse, stating that 'as one rides the practices of co-presence' integral relationships between place and mobility–actual and electronic-- takes place (Urry, 2002; Ito, 2002; Morse 1998 in Hjorth 2005, 1), and the domestic may no longer be physically present in the actual home. (2005, 1)

Further Domestication

The sound of one-way, private conversations, ring tones, one per phone; the tiny chirping noises of arriving text messages, and increasingly the detached posture of stares into glowing small screens, raises awareness of mobile media in public space and its, at times, visible concentration. Hjorth's writes of these moments as 'feelings of disjuncture' (2004, 1) when they become highly apparent.

In her seminal study, 'On the mobile: The effects of mobile phones on individual and social life' (Motorola, 2001) cultural theorist Sadie Plant responds to the mobile urban sound scape, 'the sonic world… warbles, beeps and tunes of the mobile have become so common that their calls have begun to constitute a new kind of electronic bird song, changing the sound track of the cities…' '(2001, 29) Another dimension of this ringing sound scape is the point at which, the 'here' of the invisible caller is heard by the visible receiver bringing with it for the listener, the 'half experience' of the 'here'. (Plant 2001, 47) While this co-presence signals an end to personal private enclosure (one can be heard) and demarcates spatial limits (one is here and there), imagination of the 'there', the 'far' and the 'near' is its cumulative effect.

The disruptions caused by mobile devices: overhearing conversations, ringing ring tones in symphony halls or cinemas, ring tones in quiet areas, are what McKenzie Wark dubbed the 'cancer of cell space' in 2001; an acoustic scourge if not controlled and others, including Plant (2001, 30-32), and Richardson have written about. (2006) After a decade of frequent exposure, this intrusive aspect has become under greater societal control through restrictive signage, internalized behavioral rules, and even laws. Perhaps societies have grown more tolerant and accustomed to the annoyance. It is fairly frequent that an uncontrolled ringtone is observed with humor. There may even be a desire for some part of one's conversation to be heard as part of the display of mobile telephony between the sexes, or between couples and friends. (2001, 38-45) Curiously, many cell phone users 'lie about their locations when talking on the phone'. (Townsend 2000, 3)

In another hugely important description and analysis, body language is the key concern. Plant

focuses upon physical behavior of cell phone users looking for commonalities between users, for gendered differences, and some ground upon which to compares and contrast mobile phone display, carriage, and body postures across cultures. Some postures, she argues, are new, in fact, and have been developed for use with cell phones (Plant 2001, 49-55).

The presence of cell phones and mobile devices (increasingly the well-lit tiny screen in cinemas which has not been diminished is also a problem) has continued affect upon urban space both pro and con. In the discussion of their domesticating impact, communications increasingly privatize to the extent that private conversations, and increasingly feature length films, or other media played on small screens, are available on mobile devices in public space. At the same time, this offers potentially a creative landscape for public information and activity. Resulting communication may be perceived negatively as isolating or offering only temporary belonging through intermittent co-presence, the familiarity with or irritating intrusion of the technology, its noise and its associations.

Public Sphere(s)

While the idea of the commons meant an idea of place, a central square or 'green' upon which civic community, exchange of goods, and right to dissent could be politically enacted, and like agora, it became an operative metaphor for discursive networked spaces, notions of public sphere have generally been oriented towards all modern media after the book and the newspaper. Concept of the public sphere arose with respect to the rise of modern consciousness, the arrival of the printing press and modern notions of a literate, public audience. Jurgen Habermas theorized a public sphere as part of centralized media. His version has been criticized, most clearly by Nancy Fraser. She argues that Habermas' ideas are too monolithic about public space. She argues instead, that several public spheres exist: diasporas, public spheres, regional public spheres, and emerging global public spheres, (Fraser 2005: 1) Fraser believes that the transnational public sphere has difficulty precisely because it is not bounded, resulting in spheres which are 'increasingly transnational or post national with respect to each of the constitutive elements of public opinion.' (2005: 5). Her conception includes subcultures, race, class and gendered

meanings and has been generated in response, partly to global and, even, mobile networks. While magazines, newspapers, radio and television have evolved relationships to the 'public sphere, the Internet and cyberspace operate under new conditions. Much public sphere is now found online converging in the blogosphere, news blogs, YouTube, and increasingly in Facebook. The mobile public sphere is yet another dimension: mblogs, txting, and Twittering are immediate convenient platforms for receiving and sending messages. Online and mobile communications vastly alter Habermas' conception of a single public. Instead, there are multiple publics (Varnelis and Tuters, 2006) and public opinion and response is a critical component in the construction of news and information. Today's communications networks offer a parallel universe to the centrality of broadcast programming and print news and mobile media moves well beyond online communications in several significant respects.

Mobile Public Sphere

Wireless mobile media solve some apparent challenges in the public sphere to historic information and access divides of fixed and online communications already elucidated with regard to the Internet, World Wide Web and decentralized computing. Wireless mobile media accommodates numerous spoken languages and is therefore more easily utilized than written communication, even with online translation. It is more popular and widespread among many communities and cultures due to ease of use, cost, availability of networks, than the computer-driven, and certainly, wired Internet. Wireless mobile media has also proven to operate where other network access may fail. As a result of wireless mobile media, public(s) sphere(s) may develop as follows:

1. To create arenas for dialogue, participation in voting, speed of exchange of ideas and news in a positive direction.
2. To enable users to interact with media outlets, gain information, access sources

Polling, responses to news, and/or emergency alerts, texting and voting are all available avenues for increased participation and engagement with events. Used for voting (thus inserting viewer

voice) in Reality TV programs and as the primary interview medium in the 2006 study California Dreamers, conducted by an outside agency, Bendixon and Partners, with California young adults ages 16 through 22, cell phones have already proven to be an extremely useful entertainment and research tool for audience response. Bendixon and Partners writes:

> The key objectives of the poll were to capture the opinions of California's new generation…on various issues affecting their lives, as well as to gain an understanding of their educational goals and their perceptions of the UC system…A new interviewing technology was utilized for this research in an attempt to connect with young people through a medium they are comfortable using…To this end, all interviews were conducted via cellular phone. To this end, all interviews were held via cellular phone. (New American Media, 2006, http://news.newamericamedia.org/news/view_custom.html?custom_page_id=340)

Wireless networks and devices are already, in these contexts, conceived as public instruments capable of social, tactical interaction. As the technology moves in, new modes of wireless public design has developed, including the social research and interface/network design of Proboscis (London, UK). Notions of 'writing the city' by users through GIS, text, and images appear in scholarship on mobile media. (Gemeinbeck, 2007). IPhone applications are now being designed by artists as informational tools and creative projects. Without such design, implementation, and political personalization of public space, concepts of the wireless city remain mired in privatization strategies and the domesticating of these tools in market advertising and literature, as mere renditions of earlier, familiar forms–the landline telephone and the Internet, to name two. Wireless networks and technologies are neither simply like cellular, like the old telephone, nor like the Internet. Specific characteristics of wireless make them superlative to all.

City-wide and Community-based Wi-Fi Planning

Having investigated several specific contexts and characteristics of wireless media and their effect upon or integration into public space and the public commons, this Chapter now looks at the installation of Wi-Fi in greater detail, reflecting upon areas of its development and

implementation which reinforce the robust, cooperative, politicized communications trends of recent decades, namely universal access and digital inclusion.

Relatively new, Wi-Fi brings about certain concerns for urban culture with respect to implementation, ownership, and use. Definition must be given to growth of wireless cities where there are large scale infrastructural debates about Wi-Fi, some municipal wireless movement, and unequal distribution of existing bandwidth. Technically, it is noted here, Wi-Fi infrastructure differs from other wireless technologies in terms of lower cost, ease of installation and maintainenance. It is also, more energy efficient.

Arguments for free or low cost municipal Wi-Fi are an essential for communications justice in the 21st century city. If cities are to retain communications parity for all and boost the efficacy of the public commons as a worthy value, then inexpensive, effective access to timely communications tools is paramount. Following are key debates and projects in the history of networked communications.

Universal Access and the Role of Wireless

Universal access debates are remaindered from the era of the early Internet when so called "utopian" aims for the Internet were high and the medium was new. After much analysis of resulting digital divides in the dissemination and uptake of digital communications, universal access was still an important issue. It is the idea that in a democratic Information Society and Economy, where information and knowledge are paramount for survival, affordable access to effective and reliable networked communications should be universal. Wireless, it is argued here, simpler and less expensive to install than other technologies, can be an effective means of eradicating access divides among populations and within particular geographies. As another communications tool added to the wired Internet, broadband, fiber optic cabling, and so forth, Wi-Fi creates or extends communications infrastructure where little or no networkability existed before. It is therefore, crucial in understanding solutions to the universal access problem in contemporary cities.

Digital Inclusion and Moves towards Equity

Municipal access or the installation of free, citywide wireless and Wi-Fi exert themselves through concepts of democratic communications, lowered cost and community control of networks in the sense of their worth as a public utility. Municipal access generally includes partial free Wi-Fi, first installed in public libraries, schools, universities and hospitals. But, since the early 1990s, in keeping with other community-based technology movements, critical thought towards redressing digital divides, or 'digital inclusion' has been in vogue. The Center for Digital Inclusion (CDI), an international NGO and global network, started in 1995 has worked with numerous global organizations, including the World Bank, to spread Internet and computer literacy education. (http://cdiglobal.org) The 'digital inclusion' movement has also expanded to include the installment of free Wi-Fi in underserved urban and rural areas.

'Wireless Philadelphia', a project in conjunction with the Digital Impact Group, involves efforts to make Philadelphia into the first city in the United States to have citywide free or low cost wireless and uses the philosophy of 'digital inclusion' expressed here:

> Wireless Philadelphia is a non-profit organization created in 2005 with the primary mission of bridging the City's vast digital divide. Over the past two years, we have developed an innovative program to help low-wealth families gain access to critical technology resources. While the organization's programmatic and financial realities were completely altered with the transfer of Philadelphia's Wi-Fi network in June of 2008, with more than half of Philadelphia's households still lacking the technology necessary for full access to employment, education, health and other life opportunities, WP remains utterly steadfast in its core mission of Digital Inclusion. (Wireless Philadelphia, 2005, http://www.wirelessphiladelphia.org/)

Wireless Philadelphia 'digital inclusion' strategies have been aimed at low-wealth households and have served as a model in other cities such as Corpus Christi TX to develop free citywide Wi-Fi. (Waxenberg 2007)

San Francisco, California: City Wi-Fi and 'Free the Net'

NYC Wireless and the Digital Inclusion Task Force in San Francisco have been started more recently. Pundits of 'digital inclusion' from San Francisco's city agencies argue that while government services are expanding online, it is unequal and undemocratic for citizens not to have online access and computing skills. (Digital Inclusion Task Force, 2006) Attempts at agreement on free Wi-Fi governance have been stalled in San Francisco by huge indecision. As in many urban communities around the world, community based wireless LANS and initiatives towards 'community Wi-Fi antennae networks' have brought in free or inexpensive access without 'officialdom.' Meraki, a private company in Mountain View, California, started by members of MIT's Roof Net, operates a project called 'Free the Net', donating wireless equipment for rooftops and 'free of charge Wi-Fi transmission boxes' to low-income communities of San Francisco. This model of development is a test and will eventually blanket the city and be used in the third world. (Meraki 2008) Municipal free Wi-Fi in public libraries and schools, and those found in public universities such as San Francisco State, comprise the zones of public, free Wi-Fi available in San Francisco coming from the city, not private vendors. There is also SFLAN a community-based network. What Meraki has done is to target the affordable housing communities of San Francisco, establishing wireless presence in 42 of San Francisco's 52 neighborhoods.' (Meraki 2008)

Despite this successful progress in accessible Internet development through wireless, digital inclusion data for the city still shows substantial divides, proving that access and use are two different things. As a whole, despite Free the Net, the city is still largely on a per 'hot spot' model for wireless and without a citywide plan that adequately addresses digital inclusion.

Challenges to 'City-wide' Wi-Fi planning

By contrast to San Francisco's spotty and divided city-wide Wi-Fi planning, nearby Concord, CA, a much smaller city, in an effort to make Concord a more attractive place to live and work for its 12,000 inhabitants---'for all residents and businesses' (City of Concord 2006), has installed citywide wireless in only three years time in collaboration with Metro-fi, a local Californian

carrier. This is not to say that the size of the city installing makes a difference, but, rather, to suggest perhaps, that smaller areas will become wireless sooner than large ones due to less conflict of interest and more in common interests for doing so.

In some cases cities with Wi-Fi also suffer from overburdened networks, poor signal and other concerns. (Waxenberg, 2007). Google and EarthLink competed to carry San Francisco and nothing could be resolved. Earthlink set up a free broadband Wi-Fi system in New Orleans, after Katrina, however, an instance of free Wi-Fi as a provisional or emergency tool, donated by a telecommunications carrier, for purposes of linking communities. (Planet Gadget, 2006) 'Citywide' is also not an easily applied term. More often, parts of cities, districts and neighborhoods, will install high-speed wireless bandwidth followed by some other kind of urban growth, lending, even, a sinister element to its implementation when coupled with property values and the role that real estate developers play in absorbing cities into their profits.

Community-based programs

Communities on a municipal or micro local scale will also take the initiative to install wireless collectively or with a partner such as Meraki. Meraki, by targeting a particular demographic--the affordable housing market--works with the unit of the neighborhood to build a larger network. A progressive universal access philosophy is thus visible in moves not only towards the free transmission of signal (aka free Wi-Fi) but in free, or low cost, programs supplying public terminals and computer-literacy training. These public service resources, citywide in recreational centers, libraries and schools, act offer, thusly, distributed wireless access to the struggling public sector. Other examples of how new communications technologies influence the design of public building and the effect of wireless technologies upon civic architecture and neighborhoods offered here are:

- The award winning Main Public Library in San Francisco, completed in 1994 by Pei, Cobb and Freed was equipped with Ethernet sockets and power points at each study carrel. The perceived need in this design was portable laptop usage. (Note: There is now free Wi-Fi throughout the library system.)

- San Francisco Unified School District has adopted laptops and wireless devices to save space. 'Mobile labs' have been created to replace 'wired' computing labs. The mobile labs are wheeled computer carts loaded with portable tools, hard drives and electrical leads, to offer flexible teaching possibilities. Any part of a school is thus a lab as long as there is electrical power, connectivity and classroom space. Fixed lab space is then made available for other purposes. (Notes of the author.)

More on Digital Inclusion

Efforts at a digital inclusion campaign between the Department of the Controller and the Department of Technology and Innovation in San Francisco resulted in the published study, 'Digital Inclusion in San Francisco', a document created in collaboration with the Goldman School of Public Policy at UC Berkeley. (Berman 2007) The study raises two questions: one, where is there a lack of access in the city? Moreover, where is there a lack of home computer ownership? Findings in the report showed digital divides in low-income neighborhoods, largely, the residential communities of immigrant populations and people of color. (Berman et al, 2007) Efforts have been made to redress the city's divides through Wi-Fi in an initiative between the Department of Technology and SF Tech Connect, a public service organization. (Digital Inclusion Task Force 2006) Meraki Corporation continues with their 'Free the Net' program.

To understand 'citywide free Wi-Fi' in San Francisco, then, it must be understood, that much of the 'Wi-Fi' lies in inaccessible, password protected networks for private residences and businesses. A quick trip by car around the city with an iPhone, trolling for networks, finds most named Wi-Fi networks secured and few open networks available. (Notes of the author). This research connects to Wellman's argument (see Chapter 5) that private households play a critical role in networked urban development since they comprise one of the most prominent markets for Wi-Fi distribution. Regularly installed in wealthier apartments and single family dwellings, but more invisible in lower wealth neighborhoods, this ad hoc condition of communications planning is clearly demographically dependent. The geography of demographics being what it is, then, higher income neighborhoods become wireless while progress is slower for low income

neighborhoods. Wireless is also more desirable where laptops and other portable devices are owned (not usually a condition of poorer homes) or in households, where wires are unsightly, difficult to rewire, or outlets are difficult to install. In the commercial sector, Wi-Fi networks enhance the customer experience, and are, therefore, a 'selling point' for commercial zoning. (Notes of the author)

Public Access History

A history of active cooperation in non-profit sectors and public space exists makes continued non-profit or open access thinking possible. For example, in projects such as SF Net (see Chapter 5) and the inexpensive pay-for Internet terminals installed in cafes, bars, hotel lobbies and airports starting in the mid-nineties, some effort was made to extend online communications into publically useable space. Most importantly, diffusion of affordable, accessible networked technologies into the city distributed access to the Internet to populations outside of dominant markets which tend to assume a level of economic bracket, thus, ownership out of the reach to 'others.' The 'free Wi-Fi movement' bears some resemblance to early Internet history; when personal computers came down in price, Internet access became a public issue and democratic communications, relative to the rise of the Internet and its potential commercialization and privatization, came under public debate and criticism. Universal access debates are thus raised once again in the Wi-Fi era. Most importantly, wireless *itself* is not simply the answer to universal access; while it may help to cover areas where some digital divide occurs, emphasis upon its usage and equipment may enable others. For instance, cost leaves some users with a cell phone only, while others are awash in speed and applications via an iPhone or a laptop, and some without roaming access while some have 3G and premium services. It is nearly impossible to equilibrate devices and platforms in the wireless era. Despite how 'emerging' and easily installed 'free Wi-Fi' appears to be, community progress to redress access and equipment is slow and the degree to which societies have become privatized and are limiting, out of fear and contempt, concepts of public space is problematic, another form of fortressing, increasingly part of the urban mentality.

More on Implementation of Wireless in Cities

Wireless implementation in cities has notably followed some similar patterns across the US and the Westernized continents of Australia and Europe. Bryant Park, New York City c. 2000—was 'one of the first places to install this amenity' targeting lunch hour users. It was a group of laptop wielding architects who created this as a publicized media event. (Mitchell 2003: 50) In Adelaide, Australia, a combination of forces, including the yearly Adelaide International Arts Festival, which attracts travelling artists, brought about wireless, first in a string of Internet cafés and then in most businesses in the central district, making Adelaide the first Australian city to go completely online without wires.(CSDMS 2006; Debelle 2003)

> No busy signals, no fiddling around with phone jacks, and best of all, no wires - Adelaide has become the first city centre in Australia to be permanently online, through a contiguous wireless local area network that is open for business 24 hours a day. (Debelle 2003:1)

Queen Street Mall, Brisbane, Australia went wireless (c.2002) when Brisbane City Council IT put up two antennae at opposite ends of the pedestrian corridor and tested its commercial viability among laptop users in an effort to promote downtown Brisbane, café use and sales. (Interview with Brisbane City Council IT, 2004) Free Wi-Fi, available at the State Library of Queensland (c. 2009) brings laptop users in during the day to enjoy both the Internet and the air-conditioned architecture. Considering the popularity of online life, gaming and communications, wireless in these examples should be viewed as a selling point for urban place. However, Australia is one country with a significant government policy adopted around wireless and broadband IT. At the same time, however, there are an active 2,000 plus users in community-based Brisbane LAN. (Brisbane Wireless) Citizen ownership of communications means less reliance upon telecommunications industries and government and is a phenomenon despite progressive government policy.

Wireless v. Wired

Wireless technologies are not simply interchangeable with the wired world, nor linear in their

emergence as a utility and culture. Free Wi-Fi and universal access movements exist in common with pay-for cellular telephone networks and proposed, commercially backed citywide Wi-Fi projects. The larger-scale, well-budgeted, more imposing network projects are bound to affect the installation and ownership of fibre, the cost of copper, and the popularity of the wireless device market. Wi-max and 4G are just now being introduced. They carry with them potential benefits not available with Wi-Fi. On some levels it is conceivable that cellular networks could dissipate altogether, if free Wi-Fi and Internet phones become commonplace. In terms of cost, wireless broadband and free Wi-Fi compete with cellular technologies. However, while free Wi-Fi and wireless broadband do much for networked space, cellular's contribution has been to provide a rapidly deployed, reliable, relatively inexpensive and convenient alternative to the landline phone. Ethernet broadband, however, (or wired Broadband) is still significantly faster than most Wi-Fi networks, while fixed wireless is comparable in speed. (Techsoup 2003) Moreover, capacity to have a temporary phone number and not to pay exorbitant installation fees makes the cell phone *popular*. Cell phones, frequently used among backpackers, homeless people and travelers in need of 'locality' are a common social 'connection' to place. Cell phones have replaced residential landlines by 6 percent in the United States, as of 2005, according to findings from a Cellular Telecommunications Industry Association study. (Point.com, 2005). Figures changed dramatically from 2006 when 13. 6 percent of all US households were 'wireless' to 2008 when figures went as high as 17.6 percent, according to Mobile Marketing blog in their report, 'Mobile phones replacing landline?' using statistics compiled by the Center for Disease Control from research conducted on 30,000 US families. (Mobile Marketing, 2009) Wireless networks thus are vastly distinguishable from computer networks, portable or not, for reasons of their capacity to 'reach' into public space and the means and experience by which social connection is made.

However, debates surrounding the accessibility of free Wi-Fi as *an ideal*, like free press in a democracy, existed in the wired as much as they do the wireless era. Assumptions cannot be made that 'free Wi-Fi' is proliferating simply because of ubiquitous tools, though wireless network penetration differs country-to-country, region-to-region and city-to-city.

Conclusions

The *'recombinant'* perspective, focusing upon hybrid forms, re-combinations, and spaces… (Graham 2003: 113) also tends to view cities as 'non linear' in their development and are non-techno deterministic in terms of technological progression. Cities fluctuate in states of dynamic, simultaneous enactment amounting to the pervasive 'presence' of technologies and the social conditions surrounding them: lingering feelings from previous eras, but also, newer ones of hope, identification and thrill. Older technologies work as a backdrop for new technologies and their unique characteristics, together becoming recombined. An example would be telephone landlines (one purpose) used for Internet transmission (second, grafted on purpose) and then having broadband cabling added, or broadcast towers (first purpose) having wireless antennae attached to them (second layer grafted on) to take advantage of their height. From within this perspective, new technologies are 'transformative'. Anthony Townsend, proponent of free wireless in the US comments: '…context-aware computing will emerge as the third great wave of modern digital technology' (Townsend, 2000; 2006) and Howard Rheingold proclaimed similar social transformation with wireless communications in his book, *Smart Mobs*. (2002)

A micro condition of recombinant thought is the position that pagers, photocopiers, televisions and now context-aware computing together introduce new possibilities for action. These would include whatever the prevailing technologies in the presence of others might be, as well as social responses to them, including, forms of resistance. Combined effects of networked technologies upon urban space can then be identified as networked space manifests in the 'recreation of cyber cities.' (Graham 2003: 113) To illustrate, it has been written that the elevator and telegraph are two technologies which radically altered architecture by changing our relationship to location. (Carey 1989; Tarr 1987). The telephone had a profound 'distance closing' effect. (Townsend 2000:3) In 2006, the University of Southern California held a 'Networked Publics' conference at which simultaneous networks were explored, with respect to social conditions, and notions of 'multiple publics' were undertaken as a growing urban condition. (Varnelis ed, 2006) This exploration suggests not only an emerging, changing potential public sphere, but that some effects

of networks exist as overlaps or blurs between/in language, use, and the installment of technologies with respect to the history and context of other technologies. In other words, the perceived ‘multiple publics’ have at their disposal variable means and, therefore, marked discrepancies in their application of technological networks, yet they inhabit cities simultaneously. Necessary juxtapositions and conditions for diverse and variable social interaction arise as a result, and additional spatial effects may be experienced. What is present today, in terms of wireless media technologies is a nexus of broadband, cellular, Wi-Fi, GPS and GIS with innovative social media following in the online context and exploiting the mobile. At the same time, the border, not the network, demarcates geographies of space, of spaces between spaces and is increasingly, electronic.

CHAPTER 4

Mobilizing Urban Space

> Nowhere escapes the net. A map of all the webs passing through any particular space would be impossibly dense. Invisible networks seemingly threaten visible means of defining space, dissolving walls of buildings. The architecture of borders, walls, doors, and locks gives way to that of passwords, firewalls, and public key encryption and security certificates. Indeed the idea of a space occupied by networks or superimposed by them has been replaced by that of the idea of overlapping networks within which physical space only appears as a fragile artifact…(Wigley in Chun and Keenan 2000, 375)

Introduction to the Two Part Study

An increasingly visible set of connections between architecture, media and urbanism has been evolving. In 'Network Fever', Mark Wigley points out that Buckminster Fuller argued in 1975, that 'it is precisely the stability of unseen infrastructural networks that makes global physical instability possible and desirable; that the global village makes possible 'the hyper mobility of people and architecture; and that designers should 'aim for 'formless' systems of unsettlement rather than overcome them.' (2000, 393) At the same time Wigley notes that today's architectural discourse is too devoid of such concerns (2000, 393). Networks have become, as the computer is 'rediscovered'… 'playgrounds of the future.' (2000, 393) His concern, in this comment, lies with the role of the architect as a potential stabilizer in the discussion of architecture *and* media *and* communications. (2000, 393-4) With respect to hype around the so-called impact of wireless, the question of newness and what ideas or habits, or even technologies are becomes clear. Secondly, it is worthy to discuss how architecture and its essential role in culture and identity-formation is perceived as "networked" in relation to media and communications culture. This Chapter, then, involves the study of theoretical and networked

urban space. The study consists of two parts. Part One is an examination and discussion of six theoretical models of networked space. These models offer historical perspective on the history of the idea of an architectural telecommunications space within cities and societies and suggest areas where mobility has affected substantial redress of social conditions.

Part Two offers eight abstract conditions of networked space perceived as helping to define contemporary urban space or to constitute the networked architecture of cities.

Part One: Theoretical Perspectives on Networked Cities

Given that cities are in transition, Part One is a study of six theoretical or critical perspectives which form a foundation for an historical framework from which to view the emergence of 'wireless cities'. Taken from architecture, architectural history, communications theory, philosophy and urban planning, examples start with Foucault's theory of the 'disciplinary society' in which he first associates the history of architecture with a history of ideas on the social organization of space, their effect upon social behavior and the philosophical construction of 'self.' Foucault's thought introduces us to a discourse on surveillance and to certain models of productive labor identity, namely, the nineteenth century social enclosure of Jeremy Bentham's 'panopticon'. His critique of surveillance, then, is key to understanding Gilles Deleuze's 'society of control' (1987), a contentious politicized perspective used here, in depth, to address surveillance, shifting signs of postmodern identity and social control. In the move from Foucault to Deleuze, a breakdown of organized enclosure and prescribed social roles takes place and this shift is attributable in part to the rising utilization of new communications technologies. William Mitchell's *Me++: The Self, the Cyborg and the Networked City* (2003) then offers the reader an example of networked cities as totally wireless, electronically mediated urbanism, both lyrical for its capacity to be individually navigated and frightening for its explicit alienation. This work, too, is post-Foucauldian, in the sense that Mitchell is describing states of wireless loss of enclosure and the shift from enclosure to dis-enclosure, though without an explicitly Deleuzian vocabulary The fourth part of the study is occupied by comments on mobile architecture. In this section, design group Archigram and digital architect Greg Lynn, with histories of motion and machine in

computer art and experimental architecture are discussed in the context of the historic design interest in motion and media in architecture and urban space. A fifth section discusses 'flexible utopia' and Dr. Melissa Gregg's critique of techno deterministic markets and techno utopianism. Dr. Gregg precisely outlines some of the going illusions of flexible utopia in the context of urban space and contemporary labor relations. Finally, a sixth and final section is devoted to examples from Robert Sumrell and Kazys Varnelis' notion of 'post urbanism' (see Chapter 1 for introductory remarks) and how these authors' view the collapsing material culture of architecture and rising immateriality of networked communications.

a) Foucault's disciplinary society

Most of Foucault's work on discipline examined eighteenth and nineteenth century European societies where the development of social institutions such as family and marriage, as well as education, hospitals, prisons, and the consolidation of knowledge into professions took place. Foucault's seminal work on disciplinary society and interest in surveillance culture brought with eighteenth-century utilitarian philosopher, Jeremy Bentham's, 'panopticon' as the paradigmatic model of enclosed power. In the panopticon a prison warden is capable of "seeing all" while not being seen himself and his power extends in all directions. David Lyon devotes considerable attention to the panopticon as a model of surveillance in his first book, *The Electronic Eye*. (1994) and later in the book *Surveillance Society: Monitoring Everyday Life.*(2001)

Social Orientation

Individuals' roles in relation to 'the mass' constituted social relations (Deleuze 1988 in Graham 2004, 75). These bounded social roles, along with their conventions, were inscriptions of the capitalist, industrial society that served to gain. Class systems evolved, thus, amidst accumulated wealth and property as individuals passed from one closed, functional, productive role-based environment to another, each one having its own laws: family, school, barracks, factory, hospital or possibly, prison. (1988 in Graham 2004, 74) Inscribed by place as well as class, social hierarchies revolved around what one was born into; how one dressed; where one lived and worked, or did not, and formed the basis of one's future prominence or invisibility in work, life,

or profession. The architecture of these societies reflects the values of segregation and separation which reinforced the social roles. Victorian England's residential architecture split the served family and owner from service areas and servants' quarters of the home and in Victorian society, social discipline, as a cultural practice and exercise of power, required enclosure, an economy of privatization, and specific forms of production. The emphasis upon interior space emphasizes enclosure for social and domestic life (family) as well as for institutional architectures where societal organizations played out (school, work, prison, hospital). Interiors were spaces for familial and social surveillance. Entertainment art forms of tableaux, stage plays, and the design of private theatres for Victorian interiors were common. Interiors also, often involved, complex viewing systems, screens or partially obstructed views; interior windows within partitions, beaded curtains and draperies for purposes of separations both practical and acoustic as they were voyeuristic. Likewise, hand held optical devices (lorgnettes, stereoscopic viewers, frames), furniture and screen design, enhanced the social play of parlor games for flirting and entertaining. Regarding non-residential surveillance, Deleuze offers the following description of the self in disciplinary productive space:

> …the ideal project of these environments of enclosure; visible within the factory: to concentrate; to distribute in space; to order in time; to compose a productive force within the dimension of space-time... (1988 in Graham 2004, 74)… this model succeeded that of the societies of sovereignty; the goal and function of which were something quite different...to tax rather than to organize... (1988 in Graham 2004, 74)

Resting upon the design of objects, notions of enclosure, and heavily coded social roles, the disciplinary society is also an analogue-based society, apt to be defined by enclosure, where individuals are expected 'to move one space at a time in a series from 'zero' at each stage; each stage being an 'independent variable. (1988, in Graham 2004, 74) Enclosures, Deleuze writes, of Foucault's ideas, are 'like molds' where the role of the individual is cast, as it were. (1988, in Graham 2004, 75) Media cultural critic McKenzie Wark (Wark in Graham 2004, 72) further regards 'disciplinary' in terms of the technology in use and its capacity to either enclose or extend

or both. He describes ‘disciplinary technologies’ such as panoptical prison designs (Bentham) or clinics, as ‘enclosing’ in the vocabulary of architecture and militarism:

> …they count and rank what they enclose and by contrast, the telegraph and maritime navigation--are ‘vectoral’ rather than disciplinary technologies, extending their grid out across open space, and project lines of movement across it, they steadily make any resource something that can be connected to any other...In the periphery, vectoral power is always greater than the power of enclosure. (Wark in Graham 2004, 72)

b) Deleuze’s ‘Society of control’

Towards the end of the nineteenth century and continuing to the late twentieth century, disciplinary societies, or societies of enclosed, prescriptive, institutional spaces: families, scholarly, and professional environments, were thrown into substantial crisis. (Deleuze 1988 in Graham 2004, 74) A climax of this crisis in the eighties and early nineties was seen in the rise of post-modernism. In American art history, Hal Foster articulated political positions in the newly changed field of art. *The Anti-aesthetic: Essays on Post-modern Culture* (Foster, 1983) documented radical transformations in post-colonial critique, photography and architecture regarding audiences’ role in viewing and perceiving meaning in the work of the art. A decade earlier, Lucy Lippard and John Chandler had declared the art object ‘disappeared’ documenting substantial changes in the structure of the art world brought about by conceptual art and the rise of such objects as multiples, artists books, and performance documentation. (Lippard and Chandler, 1973) Theoretically, both of these texts support the idea that the art object was transforming as an original, one-off item with inherent meaning to a space of meaning that could be "read." Multiple “readings” imposed by audiences became as important as what was made. This immaterial gesture has some parallels to the ‘value added’ to products today.

Replacing Disciplinary Societies

By 1988 when Deleuze published the ‘Postscript on Societies of Control’, as addenda to *A Thousand Plateaus*, he observed that societies of control were ‘replacing the disciplinary societies…’ (Deleuze 1988 in Graham 2004, 74) Eminent military space and architectural theorist

Paul Virilio, 'analyzes the ultra rapid forms of free floating control that replace the old disciplines operating in the time frame of a closed system.' (Deleuze, 1988 in Graham 2004, 74) The highly influential text, *War and Cinema* (Virilio, 1984) bears some specific relevance to modes of perception for tracking and watching social behaviors which have come about as a result of aerial and satellite views. In *War and Cinema*, Virilio recounts the invention of aerial photography (as well as air to ground radio) that began during World War I as a reliable method of data gathering. He writes (1984, 17) 'by 1914, aviation was ceasing to be strictly a means of flying and breaking records … it was becoming one way, or perhaps even the ultimate way, of seeing …' Subsequent moments of technological development carry with them new perceptions of space. Even Deleuze's phrase, 'free floating control' is implied in this history of lifting off from Earth's surface into the air; as human eyes are replaced with prosthetics. The Internet, which has posed literally infinite methods for organizing data and communications space, is thus, basis for Deleuzian 'society of control' where new social forms arise in the design, establishment, extension, and hybridization of networked space. In the 'Postscript' text 'societies of control' are characterized as having extended, controlling power: 'extraordinary pharmaceutical productions, molecular engineering, genetic manipulations' (Deleuze 1988 in Graham 2004, 74). In 'socio-technological study of the mechanisms of control: the hospital system, the prison system, the school system, the corporate system, and banking systems' is a specific set of transforming networked spaces which contrast spatially with those of older, disciplinary society. (in Graham 2004, 75) An image of discipline, however, now manifesting in "free form" is explicit in the expanding, total systems of these once, enclosed institutional propositions. They are no longer formally contained, but have morphed into systems with parts and components, often *non-geographically* based in their growth.

Hospital as a Social Institution

The crisis of the hospital, as an enclosed form, is the story of an institution shifting from a place-based central architecture, to one heavily branded and networked; a set of interlocking, interwoven parts, all of which are extensions of its "reach" into urban space. (In Graham 2004,

75) Institutional power, thus distributed, and the forms it takes on are ever more deeply felt, the more it insinuates itself within society, but not in the same way, nor arguably, as recognizably as when more enclosed, face to face, and more dependent upon separation from the city.

Not only the operations of the hospital system, but emerging conditions for patient engagement are the very Janus-faced control mechanisms which concern Deleuze and which depart, in form, most spectacularly, from those of institutional space in disciplinary societies. Losing the commanding central architecture, service and access to data has become increasingly transparent and accessible through voice databanks, online communications, and other access points, but, likewise, patients are now (meaning 1987) equally more observable, Deleuze would argue, through the numerous micro-institutions which comprise the hospital system. At the same time, this new systemization has produced opportunities for capitalist hierarchy.

Growth of Networked Power

Deleuze, articulating potential for growth of financial markets and gross exploitation, writes:

> 'societies of control' operate with computers whose passive danger is jamming and whose active one is piracy and …viruses. This technological evolution must be even more profoundly, a mutation of capitalism, an already well-known or familiar mutation that can be summed up as follows…capitalism is no longer involved in production, which it often relegates to the Third World…it is a capitalism of higher-order production…it wants to sell services and what it wants to buy is stocks.'(Deleuze in Graham 2004, 75-6)

Graham connects Deleuze's analysis and the rise of ICTs and the 'recombination perspective' on changing cities. (2004, 74). He writes, 'Deleuze's reading hints at the subtle ways in which ICT systems are mediating new hybrids of built space and continuous electronic surveillance and control.' (2004, 74). At the core of the argument is the inseparability and overlapping state of systems in the perceived transformation of societies.

Underlying these expanded systems is a 'variable geometry, the language of which is numerical… not necessarily binary' (2004, 74-5) where 'numerical' refers to the specific *mobility* of the

subject as he [she] moves through space and operates within that society. This identity is the Deleuzian 'dividual', suggesting that within these systems, we are 'dividuated'. (2004, 75) 'The 'numerical' society is 'self-deforming' thus, continuously change[ing] from one moment to another, or like a sieve.' (2004, 75). An extension of this power that would ultimately erode its own frontiers is fortunately predicted by the philosopher. Controlling power, that which manages and manipulates dividuated space, Deleuze argues, will not only have to deal with the erosion of frontiers, but with 'the explosions of shantytowns or ghettos'.(2004, 76)

From Enclosed to Networked Power Relations

Thus, the social, financial and corporate power which concerns Deleuze has transformed in its systemic architecture, from the productive organizations of the nineteenth century through the restructuring of post-modernity (1987), and, arguably, into liaisons of the present. Until recently, the paradigm for the study of discipline and enclosure, from the standpoint of control, was Bentham's panopticon as mentioned earlier in the brief section on Foucault. (2004, 73 and in Foucault, 1977; Lyon, 1994). Even this form of institutionalized power, the prison, has changed radically, but moreover, so has the technological basis of surveillance over populations in all enclosed spaces and the emphasis placed upon it. (2004, 74). From factory as locus, to corporation as locus, to, some would say, playground (Scholz, 2009) a shift has occurred, primarily as a result of the increased technological capacity (networks) to extend boundaries well beyond their enclosures, but, also, as argued in Chapter One, due to the presence of miniaturized electronic media. Deleuze's position on this shift from discipline to control was, after all, formulated against the backdrop of post-modernity and the historic rise of personal computing in urbanized areas, a transformation in which new means for the control of information and data—networks--how it was searched and systematized---databases--were introduced, and subsequently, put to use. Writing on advertising campaigns from MCI, Compaq, IBM and Origin (in 2002), literary cultural critic, Lisa Nakamura notes that being boundariless in these advertisements is expressed through the smooth delivery of innovation and technology to the Third World. (Nakamura 2002, 87-89). The capacity for content from MCI to 'liberate the user from the body' and initiate his or her introduction into the global economy (2002, 88), is the long-arm of

Westerncapital extending its "reach" and its ideas.

Personal Identity in Societies of Control

Lecturing at the School of the Built Environment, QUT, in 2003, Elizabeth Grosz, philosopher and expert on Deleuze, discussed what appears to be a lack of a spatial theory in his work, rather that he had a theory of urban capitalism. *Anti-Oedipus: Capitalism and Schizophrenia* (1984) and *A Thousand Plateaus: Capitalism and Schizophrenia* (1987) deal with this subject. (Grosz 2003**,** 2004;Graham 2004, 73) In the 'Postscript', Deleuze comments that disciplinary societies held the expectation that individuals were to follow prescriptive social roles, often linearly, from birth to death, with little room for social or class mobility. These social roles, internalization of conventions, and forms of accepted discipline mark, for Deleuze, the 'analogical model' of society. (2004, 74) In the twentieth century, however, he suggests, prescriptive social roles, boundaries between them, and the systems that separate them, including class systems, are finished (1988 in Graham 2004, 74). Note: Deleuze also attributes his use of the term 'control' to William Burroughs. (2004, 74)

c) William Mitchell's 'Networked City'

A detailed version of the networked city shaped by ubiquitous wireless communications is offered by the late William J. Mitchell, architect, urban planner, and one time Dean of Architecture and Urban Planning at MIT, in the book, '*Me++: The Self, The Cyborg, and The Networked City'* (2003). This text takes a post-Foucauldian position (2003, 26-7) and frames the networked individual as a locus of communications, data, and production within a dis-enclosed society. Mitchell's networked citizen exists at an intersection of networks and systems of control within the emerging, wireless city. While he has written seminal works on digital media and cities for years: *City of Bits* (1997) and '*etopia'* (1999) being very influential, *Me ++* is a close examination of the wireless city and its wireless inhabitant, the fully, technologically-enabled cyborg citizen. Positioning himself as one of these, his body, a central subject for the urban wireless experience, Mitchell focuses upon mediation of public/private zones. On the one hand, unwanted surveillance disrupts subjectivity (2003, 26-29) and, on the other hand, empowerment

to create and produce identity within the city has never been greater.

Mitchell's cyborg citizen is similar to Deleuze's 'dividuated' self which exists within simultaneous, variable networks. Public and private zones created by electronic boundary-making and GPS navigation possible with hand held, satellite driven tools, are lived out in this urbanism of data transfer, information gathering, and self/identity mediation. Likewise, links between urban wireless networks and prior histories of architecture; those of urban planning for military defense and transport, in particular, complete the idea of the city as an historic locus of surveillance and military infrastructure, wireless or not, and unfavorably as potential. Meted out in the dialogue between communications technologies and architecture, Mitchell's cyborg evolves as a wirelessly enabled networked individual. He (gender from Mitchell's association in the text) is an erudite urban intellect capable of sophisticated self-management and control of networking in the newly forming urban plans of cities without walls, cities formed around location and coordinates. He writes:

> I am both a surveying subject at the center of my electronic web and the object of multimodal electronic surveillance. All of those constructions of the gaze that the post- Foucauldians have alerted us to the gaze of desire, the gendered gaze, the consumer's gaze, the critical gaze, the reflexive gaze, and certainly the gaze of power---are extended, reorganized, and reconstructed electronically... (Mitchell 2003, 26- 7)

This emergent form of the self-focused, independent cyborg also possesses history in the work of Steve Mann and Donna Haraway. Both have laid claim to the cyborg metaphor as a space of alternate existence, resistance, and intellectual independence. (Mann 1996, 2007; Haraway in Chun and Kendell 2004,)

d) Mobile architecture: Experimental Form and Nomads

In art, a significant trajectory revolves around studies of motion, humans and machines. Eminent British artist and member of the Independent Group, Richard Hamilton, launched the exhibition "Man, Motion and Machine' (1955) with the idea of pursuing kinetics as an art idea. (Mason

2008, 24-6, 35, 37, 39)

Greg Lynn and Animate Form

With digital computing, since the mid-eighties, architect and Professor of Architecture at Columbia University and Yale, Greg Lynn, pioneered experimental design in digital programming. Lynn's concepts reveal critical sensibilities towards mobility and space resulting from social interaction and data visualizations of non-specific social networks (Park 2002). Lynn has utilized these studies both theoretically and in his design practice, later calling the amorphous designs he created, blobchitecture.' The '*Embryonic House'*, arose from studying the motion of social interaction. (Lynn 2002; Lynn 2003, Park 2002) Such form-making forges productive and aesthetic links between digital media and architecture. It epitomizes dynamic mobility and fluidity, employing to units of space in digital programming such as NURBs. (Wikipedia). Lynn has used these to build new form and pieces of furniture. His work enables, thus, understandings of contemporary social interaction and demonstrates a revised sense of the meaning of motion, with respect to architectural form and machine intelligence. His approach and the forms of 'blobchitecture' suggest that the architectural enclosure is *malleable* and that inhabitants, particularly in residential space, create multiple forms of movement which effect that enclosure. Lynn's critique surfaces around motion as a factor in traditions of architecture where static form was paramount. He has redressed contemporary practice in terms not only of digital flows and fluidity but also in terms of the production of space vis a vis three-dimensional modeling software. In *Animate Form* (1999) Lynn regards different eras of architecture according to how time emerges through the prevailing technologies. He writes:

> …the dominant mode for discussing motion in architecture has been the cinematic model…multiplication and sequencing of static snap shots simulates movement. The problem with the motion picture analogy is that architecture occupies the role of the static frame through which motion progresses…

He continues:

> …in what is called 'inverse kinematic' animation, the motion and shape of a form

> is defined by multiple interacting vectors that unfold in time perpetually and openly...architecture can be modeled as a participant immersed within dynamical flows...(Lynn 1999, 11)

Whereas 'previous efforts to capture motion have resulted in the superimposition of simultaneous instances', architecture today, for Lynn, takes on new characteristics precisely because of digital media. (1999, 11) Siegfried Gideon was the first to 'establish the idea of time as built into form as 'memory' as a major theme for the twentieth century'. (1999, 12) Gideon's major works, *Mechanization Takes Control* (1949) and *Space, Time and Memory* (1941) contributed this idea to architectural theory and design. (1999, 12) Colin Rowe and Robert Slutsky's concepts of 'transparency' are also introduced (1999, 12) along with terms such as 'shearing' and 'shifting'. These terms have represented motion with respect to movement in architecture. Charles Gwathmey's architecture, known for its rotational aspects, is discussed in relation to Gideon's notions of cubism and futurism. (1999, 12; Frampton in Lynn 1999, 12) Lynn traces architecture that influenced by computerization, virtual space and/or mechanical metaphor, and suggests that forms of mobility or consciousness of movement in time, has become an architectural preoccupation. Lynn writes:

> 'a design process of sequential formal operations is recorded in the building's configurations through colors, alignments, imprints, additions and subtractions…the intervals between the moments that are superimposed generate irresolute conditions which are exploited for their destabilizing effect upon the present. (1999, 13)

Mobile media culture is relevant to the study and discussion of urban space perceived through the lens of Lynn's discourse, as the idea of the 'trace as a graphical notation of time and motion in architecture.' (1999, 12) This collapsing and colliding of time into a meaningful and non-static architecture around mobile traces, has multiple implications in the context of networked urbanism and is seen as paramount in public art projects of later Chapters where the use of 'texting' is critical to the formation of the work. Lynn's concept, then, of animate form has an underlying

Deleuzian ‘variable geometry’ (Deleuze in Graham 2003, 74) This, perhaps, articulates a new relationship to mobility and its function in architecture, where mobile networks begin to form space. In the disciplinary society, where an individual belonged to one mass of bodies or another, one could have a number in the production line and an identity, but fail to have any real autonomy from that mass. Old counting systems and methods of data collection have, however, been transformed, as Deleuze suggests, which produces new forms of ‘individuation’. (Deleuze 1988 in Graham 2004, 74) He writes:

> ...the numerical language of control is made of codes that mark access to information or reject it. We no longer find ourselves dealing with the mass/individual [binary] pair. Individuals have become 'dividuals,' and masses... samples, data, markets, and “banks.” (2004, 74)

This would suggest that computations of the body have changed from those tabulated within older counting methods to those in systems wherein data is interchangeable, increasingly dispersed and, in some important senses, such as surveillance or the exposure of private data, made perceptibly more vulnerable. The fluid digital aesthetics of recent art and motion picture dynamics reflects these “bodies.” Dividuals, like Lynn’s malleable enclosures, which are shaped by their inhabitants, are at the center of unfixed and variable networks and they, in turn, suggest new forms of motion/mobility. The Deleuzian formulation of ‘dividuation’ evolves, thus, as an immaterial terrain from which fluid mobility, as depicted and theorized by Lynn, emerges. He argues that ‘static thinking does not have an essential grip upon architecture as much as it is a lazy habit or default which architects either choose to reinforce or contradict for lack of a better model.’ (Lynn 1999, 13) Deleuzian identity, like that of Lynn’s notions of mobile architectural space, is fluid to the extent that it is both data and body. The mobile body, differing from the disciplined body, inhabits this new space of motion afforded by mobile technologies, and is capable of maneuvering within systems. Deleuze states: ‘The disciplinary man was a discontinuous producer of energy, but the man of control is undulatory, in orbit, in a continuous network. Everywhere “surfing” has already replaced the older sports.’ (Deleuze 1988 in Graham

2004, 75) Deleuze perceives the following: ‘types of machines are easily matched with each type of society…machines are not determining…they express the social forms capable of generating them and using them’ (2004, 75) Lynn’s 'blobchitecture', and thee movement he started in architecture, have been a successful attempt to create fluid cultural, mobile, social relationships digitally generating physical form as a result. Note: While Frank O. Gehry has also generated some of the world’s most renowned ‘blobs’, his architecture differs from Lynn’s to the extent that Lynn fully embraced design through computer-generated (mass generated) form, while Gehry has historically utilized handmade, physical models.

Archigram

Other mobile architectures need mentioning. Mobile architecture exists in designs of Archigram, the pop architecture group working out of England in the 1960s. These architects blurred boundaries between popular technology, architectural and urban space as well. They designed cities, in fact, that explicitly engaged architecture as module, plugged into infrastructure and as computer infrastructure and mobile object. These would be Peter Cook’s ‘Plug in City’, ‘Instant City’, Dennis Crompton’s ‘Computer City’ and Ron Herron’s ‘Walking City’ (conceived to function while in motion, in images on legs, walking and with wheels). (Design Museum 2007, Sadler 2005, Cook 1970) Other mobile designs by Archigram were the Suitaloon (1968-69), an enclosing, plastic, wearable suit equipped with microelectronics, and conceived as portable/wearable bodily enclosures which comfortably housed two persons, perhaps reflecting changing mores about gender relations, or a new mobility in urban relations altogether when it came to residential space. Peter Cook of Archigram writes about the experience of experimental design in his time:

> Mobile facilities are now being discussed in so many areas: emergency facilities where mobility may be a matter of life or death, and facilities which may need to be moved for the general economy and spread of a service…it may actually be better to bring in a more sophisticated facility than the one which can be offered in a single locality… (Cook 1970, 120-122)

Archigram conceived of the end of enclosed complexes such as large hospitals and school campuses as well as the 'extension of the idea to information services.' (1970, 122) These mobile designs, influenced by Space Age engineering, new communications technologies and new materials, are analyzed in detail in Chapter 5.

Portable, Disposable and Mass Produced

Portable and disposable architecture is a way of life for nomadic culture and in western culture, where permanent architectural form tends to dominate our definition of the 'real', nomadism has recently gained significantly greater attention as part of wireless, bicycle, green, and low-budget design. But it was Denise Scott Brown and Robert Venturi's early interest in inexpensive, mass-produced houses or mobile homes in America, partially documented in the book *Learning from Las Vegas* (1979) which elevated these prototypes and appeal to American love of road culture. Portable architecture has since had a renaissance with numerous books published on the topic, popularity in artistic and architectural competitions and practices, and examples appearing as solutions to homelessness, poverty, disaster relief, temporary need, or low budge house. In some form, in all of these contexts, networked communications has been included in the design, as if to suggest self-sufficiency as much as the hyperactive individualization and privacy of the module or unit. Sumrell and Varnelis investigate the networked space of *Quartzite,* a community of Recreational Vehicles largely for housing American retirees. (2007, 144-173)

e) Flexible utopia and Market idealism

A fifth networked society is captured in the phrase 'flexible utopia', which refers to, according to Dr. Melissa Gregg, in 'Working from Home: The Normalization of Female Labour in the New Economy' (2008), futuristic, techno determinist notions of place, largely driven by the mobile telecommunications market. Gregg argues that flexible workplaces espoused in the wireless lifestyle of mobile market advertising may not be ideal for many women and that economy-driven gender gaps may be reproduced by the very same, allegedly 'new and wonderful flexible work place'. (Gregg 2008, 3, 23 - 5, et al) Gregg cites Richard Florida: 'creative labor has enjoyed a surfeit of attention because of its sense of excitement, relying as it does on an association with

bohemian and romantic notions of the artisan' (2002 in Gregg 2008, 7). She elaborates on the goal orientations of so-called flexible work as they target populations of working women and feed their desire to balance home and family. At the same time, Gregg articulates real world issues that arise with home-based work, including the availability of a national childcare system in Australia (Gregg 2008). Her critique of how flexible workplaces supersede forms of enclosed work, in the markets' narrative, as being most advantageous in the New Economy and discussion of the new forms of precarious labor and labor relations this brings about is implacable for its indication that dis-enclosure is this ordering is a hierarchy upon labor being pushed by markets. On her terms, the fiction of flexible work does not nearly, adequately address the needs of affected workers and is a neo-liberal construct of labor relations at best. Moreover, the flexible worker-female in Gregg's research, but male and from different age groups in the advertising, must be viewed, if techno utopian development promises betterment, as being in control at all times. A similar symptom of flexibility is described here:

> Control is short term and of rapid rates of turnover, continuous and without limit, while discipline was of long duration, infinite and discontinuous. Man is no longer man enclosed.'(Deleuze 1988in Graham 2004, 76)

While dis-enclosure relieves workers from the confines and surveillance of traditional workplace, possibly creating access to new opportunities or some positive flexibility in terms of parenting, Gregg suspects the erosion of enclosure to be a loss of opportunities for secure work and workplace participation. Working parents, more often women than men, if they opt to stay home or work part time, fail to participate in securing work and participating in the social reality of the workplace. However, these affects may vary culture to culture, despite hegemonic global trends in work. In the history of flexible, digital work, as an experimental concept of independence and self-employment, brought about by the one person/one machine decentralization, opportunities also arose. Ruth M. Davis writes in, 'Computers and Electronics for Individual Services' in *SCIENCE*, a magazine published in the US:

> Ten years ago, saying that the computer offers to individuals the ability to significantly

> control an immediate environment might have been whimsical. Today, it is an observation that supported by many examples. (Davis 1982, 852)

Davis' article goes on to present personal computer use as an emerging home-based 'workplace' --- 'the popularity of individual computing', and 'carry able terminals usable at home…through remote access', 'dramatic decreases in the cost of electronic equipment' and 'the availability of electronic games on coin-operated machines or home television sets' as three major reasons for uptake of the personal computer in the 1970s. (Davis 1982, 852) One can see how revolutionary the personal computer and its potential to be networked must have appeared after the centralized era of the mainframe. Stewart Brand, who invented the term 'personal computer' and who helped start the Well, promoted the considerable utopian promise embodied by the personal computer in a countercultural online community. As editor of *The Whole Earth Catalogue*, Brand advocated personal computer ownership and decentralization, conceiving of this technology as social and liberating; a new form of interaction and consciousness. (Dammbeck 2007) An early experiment in public commons concepts of the Internet, the Well.com acted as a testing ground for artists and writers to use the Internet as a place of creative and democratic dialogue. 'Flexible utopia' relegated to an association with bohemian artistry (Florida in Gregg 2007: 7) is a gross understatement of utopian ideas in the techno culture; of open source, free information and other concepts emanating from public computing and, in Gregg's sense it is a condition of freedom appropriated, commoditized, and naturalized, for purposes of markets. In this, how consumption works is fully visible. Limitlessness, embodied in the 'flexible utopian workspace' of market hype, similar to the troubling mythology of capitalist networked societies felt by Deleuze and challenged by Nakamura as colonialism and globalization, act as preconditions for capitalism's constructs of power. That power renders absent specific populations, as Gregg points out, with respect to women, the structure of economy and work, and obfuscates our labor in labor relations.

f) Post urbanism

'Post urbanism' is introduced in the short, collaborative text, *Blue Monday,* published in 2007. Varnelis, editor of *The Infrastructural City* and director of the Networked Architecture Lab at

Columbia University, and Sumrell, a designer and writer, articulate post urbanism by arguing that urbanism has moved well beyond what we already know, from which they then propose a group of compelling perspectives on the networked space of cities. Post urbanism whereby the social function of architecture is essentially losing its meaning is attributable to the duration of the newly networked urban fabric. They produce an analysis that moves from lesser-known political connections in American government and military to such sinister forms of control as the early design and distribution of MUSAK throughout commercial workplaces. ( )

Post urbanism is, thus, defined in relation to cabling, data exchange, and telecommunications infrastructure as they shape the urban landscape. One Wilshire Boulevard, used as a paramount example, is a structure designed originally as a benign thirty story office building in downtown LA only to become an uninhabitable architectural casing for telecommunications gear. One Wilshire's management charges 'up to $250 per square foot per month in the Meet Me Room [data transfer station] …the highest per sq foot rent on the North American continent' for such purpose. (Sumrell/Varnelis, 2007**,** 63**)** The structure contains the 'guts' of numerous telecommunications businesses and is reliant on AT & T, whose own building sits next door. One Wilshire is, conceptually, a network node of gigantic proportions. It is living proof, if digital bits and electronic books were not enough, that we have moved from a materially oriented culture to an immaterial culture. (2007: 65-6) It is architecture without the normal function of architecture. It is a pure form of the digital telecommunications age; 'the palace of ether', (2007, 59 - 66), of the real estate age; of 'metropolis as locus' on a global networked scale; a post urban, proto-capitalistic place of use and non-inhabitation. In this context the post urban perspective suggest that the function of urban place is changing. It is becoming more dependent on the visibility of data communications than on an urban architecture envisioned around forms of exchange and co-habitation in the production of space. A second post urbanism that has some relevance, is the history of telecommunications and military activity offered and the notion that this inevitable connection drives many new urban (read: post urban) meanings.

Part Two: Typologies of Urban Network Density

The second portion of this analysis consists of eight types of networked urban space, loosely divided into two groups. Group 1 shares characteristics of embeddedness/situatedness in physical architecture and a high degree of proximity. Group 1 exists in the physical components of data transmission hardware and software, or in conglomerates of computers formed into LANs, towers, transponders, wires and wireless infrastructure and a high density and concentration of networked activity that is significantly established in fundamental social and cultural organizations and economies where demand and expectations for digital community and digital production are high. When enclosed within physical architecture and firewalls, these spaces are particularly powerful, capable of creating influential informational vectors across cities, nations and oceans or forming explicitly zones and districts within urban fabric. In tandem with wireless, this Group becomes even more accessible and pervasive. One example would be the onset of the mobile office/mobile banking services offered through major banks.

Group 2 is increasingly less dependent upon enclosure than Group 1 and is more dependent on empowered users and the ongoing recombination of social networks. Group 2 exists in differing configurations made possible by ubiquitous, reliable connectivity, personal and wireless media that support flexible lifestyles. Group 2 networks are shaped by non-geographically defined partnerships and work patterns. As a set of urban social networks, this spatial type is distributed, diversified, non-geographic specific and depends on social memberships with intrinsic interests in common.

Group 1

•**Space as bandwidth**-- Distribution of bandwidth and how it is distributed is a critical element of today's cities. Networks of cellular towers, data storage, hubs, pipes and transmitters which comprises the physical, inhabitable, architecture of communications, passes bandwidth to locations where it is perceived to be of highest value and/or of greatest need. This infrastructure evolves based on the technology in use, but capitalism affects who can buy it, and who will buy

the bandwidth at the fastest speeds. Particular buildings, thus, will have a density of data and transmission activity and require high bandwidth for their clients. This space of bandwidth often demarcates the locations of speed and the power of connectivity within the urban setting, sometimes reflected as density, but often as zones, districts and even security systems within the geography of the city. In the book *Mapping Cyberspace* (2001), cyberspace is rendered through maps of its size, dispersal, complexity and multitude. These visualizations are created for wireless networks and to see how they work in terms of density and sociality. Mark Pesce and Jon Tonkin produced live maps exploring 'relational space' of 3g usages for given areas for ISEA in San Jose under the title, *Blue States*. (http://relationalspace.org/) In the context, the map projects a certain type of identity-making process onto the technology. Likewise, the onset of wireless cities has raised debates again around equitable bandwidth distribution, or its spatialization.

•**Wireless districts--**'The historic social and political values of places, especially those for informal gatherings, have been the first zones to go wireless and provide free Wi-Fi to citizens. Bryant Park in Manhattan, New York, catering to the lunch hour crowd, was among the first public spaces to install free Wi-Fi in Manhattan, chronicled by the New York times as 'one of the first to formally span a city park' (Begay, 2002) and by Mitchell as 'one of the first public places to offer this amenity.' (2003,50) Adelaide, Australia, a vibrant creative city and annual location of the Adelaide International Arts Festival has been recorded as the first city in the world to bring in wireless.

> [Adelaide] is to offer international and national visitors the ability to connect to a public wireless network billable to their home ISP account. The new Citilan network went live today…linking the Central Business District (CBD) with North Adelaide along a boulevard about 5km long, and the west end arts district with east end restaurants. (i4D, 2006)

In 2004, the IT department of Brisbane, Australia's City Council, installed two wireless antennae on light poles along the central, newly designed award winning pedestrian mall of the downtown shopping zone as a test in support of local businesses. Eager to draw laptop users to their cafes

and the seating areas along the mall, the project created a zone of free Wi-Fi for the enjoyment of customers. (2004 interview with Brisbane City Council IT)

Districts become wireless along the 'hot spot' model, wherein free Wi-Fi is contained to one locale for the purposes of generating real estate interest in tenant offices, for example, or customer draw for café and restaurant business. Hot spots are found throughout many cities, and tend to originate in airports and café districts, though more recently they have become entire streets, historic areas or city parks.

•**Situated technologies--**This spatial type refers to groupings of computers densely networked via Local Area Networks (LAN) and which, as labs, offices, information centers, databanks and editing suites, belong, in the main, to private and public institutions. 'Situated technologies' is a term which emerged from the Distributed Creativity listserv (Institute for Distributed Creativity) and it regards the situated place/place making of social networks among those situated in (as opposed to not being situated) and utilizing computing technologies within established facilities, universities, school and library systems, offices and workplaces. (IDC/Center for Urban Architecture 2006) Situatedness refers to permanent and stable configurations of computer and social networks. Situated technologies connect identity to place through its history and through the culture of institutional communications. They tend to generate a networked culture in the form of knowledge, research, high standards of bandwidth, software development and use, and, symbolically, as communities and/or districts of creative civil practice. They are the slow growth architecture of computing, where infrastructure supports the social network and continues to develop over time. These communities have a high-degree of computer literacy and, often, advanced technology to which are added sophisticated wireless devices and expertise. They are an aggregated community of users, with hardware and software 'in situ' and who thus have a high degree of control over space, knowledge, time and creative work.

•**Municipal emergency service networks--**Fire, police and emergency medical services or other official emergency and relief networks are specialized and separate strata of the networked culture. They utilize both fixed and wireless networks to maintain field contact with a central

office, or land crew, and often intersect with other emergency crews who are, in turn, mobile. These service networks are not 'news and data' networks, such as *SFAlert.com* which micro broadcasts to mobile phones and inboxes. They are mobile emergency crews linked in the effort to respond to crisis. Wireless laptops are equipment now regularly found in fire trucks for accessing necessary data, the command call center and fire station officials. They map locations and prepare strategies. (Author's notes 2005-6) Service networks are separate from other social networks because they are a municipal service integral to the operations of physical cities. Because of the randomness of crises, wireless networks are particularly suited to their response. Curiously, when tsunamis hit Phuket and other parts of Southeast Asia in 2004-5 the region was remarkably unprepared for a response, relying on telephone calls, and other relatively slow means, to communicate the danger. (Author's notes, 2004)

•Home office/flexible workplace-- The home office was the building block of market ploys for decentralized personal computing and the personal computer revolution. Home offices set up around a networked personal computer were found in residential/studio/live/work spaces starting as early as the mid to late 1980s to the mid 1990s, across most Westernized nations, including Australia, the United States and Europe. Connectivity was possible with a modem and a home telephone line, and the flexibility to work from home became a reality. The very notion of what it meant to work was changed.

Home computing began to contribute spatially to a dense matrix of networked urban space in apartment buildings and neighborhoods, and to the rapid emergence of non-geographically defined communities across cities. When combined with housing complexes, networked home computing constitutes a homogeneous urban aggregate of individual and community networks for resource sharing. Home computers made the growth of networks possible and contributed to *recombinant* meanings (Horan 2000 in Graham 2004, 364) of urban communities and city life. Demands for cities, and their civic information, for maps, interactive tools, online banking, shopping and official government information, to move online has increased exponentially. Home offices, in terms of their spatial, dispersed situatedness, constitute extensions of *situated*

computing environments, where an individual's home computer is an extension of his/her formal workplace. Arising from the social conditions of the home office typology is the dogma and desirability of the flexible workplace. Home computing has meant that some digital labor is being done from home or in the home. This fact has redistributed and dispersed the workplace, a spatialization that coincides with the increased dispersal and modes of flexibility inherent in the diffusion of wireless media. Watson and Lightfoot write: 'The aim of mobile working is to allow staff to access a range of systems and services whilst they are away from the office – but without the restrictions of wire.' (Watson and Lightfoot 2003:348 in Castells et al 2007: 79)

•**Collective computing spaces-- These** make up a relatively small percentage of all computing spaces around the world, but are noteworthy for several reasons. One, these spaces have most often been independently organized around the sharing of computer equipment and other resources. Two, they are often created from political or budgetary need, at non-profit locations, art spaces, or as temporary installations during, or for, events. Three, they function as stabilizing community spaces and, therefore, are similar to situated technologies in that they usually foster strong identity and techno culture, but differ from situated technologies because they are generally grassroots-grown or are part of non-institutional public space. Indymedia Seattle or the Octopod in Newcastle, Australia (home of 'electrofringe' festival) is examples. In these spaces, computing and communication tend to focus less on individual consumption of the technology and proprietary interest, and emphasize, instead, artistic, collective or social uses of the techno culture. Fourthly, in the free Wi-Fi era of the affordable laptop, temporary installations for collective computing with high quality tools are relatively simple to set up. These spaces support the potentials of flexibility for purposes of creative communication and collaboration.

Group 2

•**Non-geographically defined communities** are interest communities, such as social networking communities or virtual communities, which exist largely through information exchange and personal networking. While these communities may occasionally rely upon 'flesh meets' in physical space, they are more often a function of online participation and have become an

everyday component, for many, of the informational and social fabric of the city. These communities, formed online, connect users across space and time. Facebook, Linked in, Move.on.org are some global and American examples. For many they are a more favorable online social medium than list-servs, which tend to support longer posts and greater specificity of information rather than casual exchange. Social networking sites depend upon Internet access but not upon geographic adjacency. Social networks most often hold together by a consensual sense of belonging, from shared interests.

•**Ad hoc networks** are networks that form in an unpredictable and fluid space for immediate or temporary reasons. They can assist in organizing goal-oriented behavior such as 'flash' and 'smart' mobs that stimulate community making in a specific temporary location. (Heaney 2005; Rheingold 2004, Nicholson 2005) Ad hoc networks support decisions made on the spot or over specific events that are unexpected, for instance, the use of Twitter in dispersing information about Michael Jackson's death brought about a community of fans. Spaces unless otherwise planned and programmed are subject to ad hoc patterns of use. Ad hoc networks are comprised of random participation. Wireless tools make them possible, in fact, in the case of smart mobbing the phenomenon almost exclusively revolves around the portability of a communications device. Small-scale communications such as txt.mobbing, a precursor to the more efficient Twitter within the contexts of crowds, has ad hoc properties. Participants can be anyone who joins the network. Effectiveness of such informational texting relies, additionally, on surrounding communications 'weather', such as proximity and the capacity to spread and understand comprehensible word of mouth reproduction of messages.

Postscript

To view the city as a place where enclosure is in transformation, largely because of wireless communications technologies, is to understand the city in terms of changing urban form. The history of communications technologies has long had an effect upon urban and architectural form in the context of the city. With the transformation from feudalism (letter writing and billet) to industrialized economy (electric light, mechanical printing, locomotive, elevator, telegraph), and

the slightly later dispersal of cinema, telephones, photography and newspapers, the urban spatial dynamics of architecture, distributed utilities, transport and social relations, has transformed dramatically. Skyscrapers, nightlife, rapid transport of goods, greater, more rapid exchange of information and goods and commuting are all consequences. Within this historical (and non linear) dynamic between urban space and communications technologies, the wireless city (along with the Internet-enabled city) is another example of industrialization and urbanization. New forms of work (and exploitation) in the dis-enclosure of institutions: the hospital (clinic and information culture) and the university (online education), for example, have become apparent. Flexible restructuring of lifestyles, cost, and labor on the part of management' flexible informational and professional relations all incorporate online technologies: remote access to vital data, scheduling, and interpersonal email between professional service providers and the served are but a few. Institutional boundaries redefined and with the persistence of mobile media, are further redefined as they intersect with the dispersed, distributed and data driven demands of constituents in the 'anywhere' of urban space.

Mobile Broadcast and Participation

Greater and more diffuse circulation of information is made possible and to more locations, the greater is the potential to create new audience. This micro maneuvering connects to the foreseeable broadcast potential of a ubiquitous medium. Powerful values of enclosed systems diffuse into space that intersects with the Deleuzian dividual. Boundaries of commerce, governance, medical and educational institutions become pervasive and the served gain access to information and participation through the new tools. As seen in Chapter 1, Section 9, access for all, in terms of right to participation, becomes a vital, political platform from which to discuss urban democracy.

Surveillance Art

In between the spaces occupied by Deleuze's society of control (1987) and Mitchell's networked city (2003) the Surveillance Camera Players (http://www.notbored.org/the-scp.html) have created art that deals with urban surveillance. As a group of pro-privacy artists working in New York City

since c. 1996, they have probed overlaps between security systems and public space, uncovering concealed security cameras, questioning the function of surveillance in numerous talks and public appearances, taking citizens on tours of public space to locate cameras, and acting out theatrical skits in front of surveillance cameras. (http://www.notbored.org/the-scp.html) This artwork constitutes critical resistance to the assumed, overly technologicalized fabric of the city and security planning at its very heart. It questions the assumptive installation and passive acceptance of surveillance cameras on city streets, in parks and other public spaces, and keeps the important dialogue of questioning this authority alive. Their work ties intellectually and politically to the creative research aims of Steve Mann, an authority on wearable computing.

Steve Mann

> Since the home is perhaps the last bastion of space not yet touched by the long arm of public surveillance, the personal computer's capacity to change our lives is not necessarily as profound as that of the wearable computer will be, as it [the wearable] allows us to transport our personal space, our existentiality, out into the world. (Mann 2007, 75)

Professor/artist/cyborg Steve Mann has long questioned the marketing of smart space and proprietary personal technologies. Early in his career, Mann investigated invasion of privacy by turning surveillance technology back upon itself. In the artwork '*Shooting back'* Mann entered and filmed a department store until asked to leave by security personnel. (Husten, 1995; Mann 1996) More recently, he has confronted similar questions while wearing a sophisticated, self-designed wirelessly networked computing apparatus on his body and in his eye: Weartap, WearComp and Eyetap webcam technologies. Through the act of wearing both a wireless camera and a computer, Mann inverts 'othering' of the user and simultaneously demonstrates how immediate responses to information and stimuli, emailing and looking at the Web, (projected onto his eye) is possible today. Through this paradigm, Mann's research embodies the idea of truly private computing. By wearing and enabling multiple functions of the machine worn intimately upon the body, the research investigates being one with the technology as opposed to

keeping it outside or away or distanced from one's self. To experience this mobile/wearable architecture is, thus, to become a 'reluctant cyborg' (Mann 2007, 7) capable of sophisticated and networked consciousness through the diversity of functions made possible by the apparatus. (2007, 11) This 'reluctant cyborg is… determined to harness technology's potential, but not at the expense of freedom and singularity' (2007: 7) Mann intervenes in the public consciousness of technologies through his work. He discusses, in his writings, moral panic and attitudes, being shunned and ridiculed in response to wearing WearComp (2007, 13-15). He rejects the loathing apparently felt, which experiences the cyborg as a non-human human when else wise, culture passively accepts far more damaging, yet sanctioned, science. He writes:

> In our society, we excuse invasive technologies as long as they are "required", no matter how ludicrous or invasive such technologies may be. However, as soon as the technologies proliferate to the general population, authorities seek to control individual use (pharmaceuticals and firearms, for example). (2007, 27)

To wear one's computer like a second skin is unusual. Hand-held screen-based devices dominate most thinking and the commercial design of mobile computing, but demand for greater relationship between the body and the technology is becoming more evident as mobile personal technologies take hold and hands-free becomes paramount, or malleable interfaces more likely. Mann's research into post-human consciousness, which visualizes the cyborg experience as if to put the viewer into the mind of the user, is not likely to be fully realized on his terms any time soon. However, Face Time in iPhone 4 (2009) and the use of Skype bring us infinitely closer, in layperson's terms, to the fulfilled desire to see what others see. Finally, trends towards giving devices (Blackberrys and Pebbles) and networks (Twitter) nature metaphors for names continues the tendency of user-friendliness, to neutralize the machine-likeness of technology and open doors for greater acceptance of ubicomp in many settings.

Conclusions

Wireless mobile computing in multiple-user mobile networks, beyond wearable computers, has also been central to the research of Steve Mann. (1996, 10-11) Very early, while still at MIT,

Mann explored bodies in mobile network exchange over weeks of time. These projects represent some of the earliest done around mobile communications and 24 hour connectivity in the urban context. Recent projects exploring urban public space and utilizing wireless devices and networks are:

City Ragas Amsterdam' http://www.cityragas.nl/about (2009)

The *DIYCity group*, http://DIYcity.org/ (2009)

The *Scalable City* http://crca.ucsd.edu/sheldon/scalable/ (2008-9)

Tactical Cartographies, http://www.an-atlas.com/contents/iaa_iaa.html by the Institute for Applied Autonomy.

All of these utilize information and mapping tools to explore the compelling social landscapes and potentials of data visualization brought about by wirelessness, including architectures of place, mobile data, and new social geography. (Green and Thorington 2008). Where infrastructure and networks have visible, creative roles in the assessment of time, culture and space, there are cultural implications. Urban networks have evolved to become very close to lived experience. 'Networked mobile communications', Wigley suggests, 'are settling in' (Wigley 2001 in Chun and Keenan 2004, 393).

Beyond these sexy navigational and cartographic experiences, renewed emphasis upon citizenship has more to do with communities, technology initiatives, and micro local interaction than it does anything "global." That said, *City Ragas,* is a correspondence game which exploits the relational space made possible between the local act of urban wandering and the global reach of networks. The different geographies and intersecting histories of two cities, and the global (international correspondence by way of communications technologies) experience is thus celebrated. In it, individuals from Eastern New Delhi and western Amsterdam are assigned as partners to each other and they participate in taking and trading photographs via cell phones according to themes prescribed by the game's designer. The result is a shared document based on themes shared and played out by the partners. Multiple-user gaming environments may act to supply alternative

social models or be ‘used as a means for studying and practicing social philosophies with productive and creative goal-oriented, collectivizing and democratic outcomes’. (DIY 2009) Urban gaming turns mobile networks into legitimized play and this has potential to augment the experience and understanding of the city. (Hjorth 2007, 183-5)

> Twitter bots, aggregators, social software, mobile apps - we use these things increasingly in our daily routines to make our lives better. Can we also use them to remake our cities altogether? How can these technologies be applied to transform urban spaces, changing them from the centralized, hard-coded things they are today into finely-tuned, fluid, user-operated systems that are efficient, sustainable and fit for life in the 21st century? Gaming environments when meshed with mobile communications become a form of social networking and potentially socially conscientious, even utopian platforms. These projects follow the experimental vein of Mann’s research and his visionary applications of these tools for educational, political and intellectual use. (DIY 2009)

‘Body’ and ‘architecture’ interface through a set of critical boundary points involving the fixed and the mobile. This mobile techno-architecture is the architecture of wirelessly networked cities. It is architecture without walls, variable in terms of enclosure. Enclosure is dispersed and decentralized and where mobile networks provide new options for resistance. Cities are thus expressed as electronic maps, replacing and redrawing older cartographies: landmarks, roads and walls that represent the development of past social relations in the mobility of information and the ‘militarization of space’ vis a vis the new technologies of the wireless city. (Davis, 1992; Mitchell, 2003, 29; Armitage 2003) The play between physical space and the space of mobile social relations continues, but, the question remains: how will urban populations utilize these conditions—to what end-- and to what extent can citizens’ participate in the transformation of their own identity and the future of cities?

CHAPTER 5

Technological Diffusion as Urban History

Introduction: The City as Networked Space

Architecture and urban history of the last thirty years acknowledge elements of distributed computing, affiliated computer literacy, rise of IT, computer infrastructure, and associated market strategies to explain the vicissitudes of urban space and movements in architectural and urban design. In short, modern computing has transformed urban space. The shift from main frames, with centrally located data, to personal computing networks of small machines in cafés, libraries, schools, private residences, studios, and workplaces signals this transformation. From approximately the 1970s to the 1980s, throughout Europe and the US, workplaces became units of a rapidly globalizing networked communications infrastructure called the Internet and cyberspace. (Dodge and Kichin, 2000) Desktop computers were designed into Local Area Networks (LANS) or Intranets, for purposes of knowledge-sharing, teaching, and learning. School programs began to incorporate computer literacy for the young in anticipation of the future economy and citizens set up personal computers at home. In short, a complete, complex revolution in communications took place in public and private spaces, across cities, countries, and continents. This Chapter explores decentralized computing as it has shaped urban space through its networks, impact upon the home, visual presence, and how corporate industrial design history, experimental architecture and urban planning have conceptualized computerization. Fore mostly, with the advent of personal computing, numerous communities, besides academia, businesses and science, suddenly entered into globalizing, networked communications. They brought with them to the public commons and the public sphere, often conflicting ideas about networks and their future. Likewise, global, digital communications, new software design, and new technologies began to produce new forms of work and diversified computer industry. In this, rapidly paced changes in the perception of location, fore mostly, with the loosening of work from place, resulted

in an early 'mobility' of data. (Mitchell 2003, 144-58). As a result of the miniaturization of hardware, small-scale systems thinking began to dominate brining with it total restructuring of banking, creative work, learning, and economies. This Chapter studies the urban history of decentralized computing in all its facets.

Structure of the Study

The study is divided into six sections exploring diffusion as urban history It begins with contrasting perspectives on corporate models of design and experimental urbanism, then moving through social space and social change affecting design and imagination of personal computing space: proxemics, space of flows, personalization, "home computing", and public computing. Changes in the workplace, transformation of cultural practices with respect to work, such as commuting, and across professions are examined. It is argued that decentralized computing and its networkability is the single most significant telecommunications vector of the late twentieth century. Given its value to human kind, it is not surprising that architects, planners and corporate culture brought to its infrastructure numerous interpretations of potential use. Added to this are perspectives on what mobile communications have done to enhance or improve personal computing Three particular developments in personal communications are examined: portability and flexibility, the movement of data from centralized mainframe to TCP/IP distribution, and the increasing complexity of the networked culture itself. This includes wireless mobility. In this the Mission District of San Francisco, where the candidate now lives and lived, and from which she writes, is utilized to discuss how American-based artists responded to this diffusion in the mid-1990s. This section offers an historical discussion of ongoing innovative practices in public computing, for which San Francisco is known.

Corporate Design and Experimental Architectures

When considering how architecture and cities have been imagined and configured around electronically networked space, the corporate R & D sector and experimental architecture have both played significant, yet contrasting, roles in the invention of a literature and body of ideas. In both fields, there have been substantial designs for computing spaces, some, even, with wireless

tools, or which heralded future technological development of cities and urban space. Similarities between them appear in the melding of computer and media technologies with architecture and use of radio, television, telephones, micro technologies and mobile technologies. However, there are significant political differences in approach. In the corporate imagination, personal computing has been described largely in terms of conventional social structures: the single-family suburban home, the traditional workspace and car culture, while experimental architects have projected futures more collective, counter cultural and utopian, including unique urban planning, collective living spaces; wearable, mobile technological devices, and the house as a living, or mobile, space. Urban networks for art, buildings, communications, education, transportation and waste disposal are evident in both cultures. Likewise, technology liberates humanity from unwanted labor, systemic inefficiency, and long distances. In short, it is a positive innovation and instrument for creative human purpose. Education, entertainment, and interactive games figure highly in both histories of design.

Ford Philco's *1999 AD*

Nuclear families, consisting of a working father, housewife/mother, two children, car and home formed the heartland of American post-war suburbia, with some correlation to family structure in other countries, such as Canada, Australia and the United Kingdom. Corporate industrials, films that presented powerful production values and stunning imagery, promoted the ideas of the corporate future to a largely white, middle class audience. *1999 AD* (Ford Philco 1969) is one fine example of corporate industrial design envisioning such products and targeting the modern family with computerized, network-enabled consumption. The film displays the single-family suburban home of 1999. The home is replete with desktop computers, two-way video conferencing, computerized exercise and personal, medical monitoring equipment, computerized kitchen and menu-making appliances, home entertainment systems, home shopping, home schooling, and personal computer companions for all. Augmenting the design of built-in furniture or occupying entire rooms, such as personal 'gyms', the house is literally an interface to the outside world vis a vis numerous, networked computers. Computerized convenience and digital

monitoring of bodily functions has minimized the need to commute to work (father), to school (child), to routine doctor's visits (father) or to the grocery store (mother). Computers interweave into the interior as a fully interactive system of household appliances and entertainment devices, networked to places and information outside the home. In Mitchell's scenario, the flexible home environment accommodates work that has been loosened from location digitally. The father conducts business from home. The mother can arrange the dinner, and have time for creative work. The child can learn via a computer in his room. They have the ultimate choice to manage everything from their desktops. Personal agency is virtually non-existent with respect to the instruments. It is implied that they are built in as part of a larger, proprietary system, or LAN. The system is set up to do banking, shopping, menu planning to free up, or liberate, time. Computer networks are also used for global entertainment purposes during a family party. In the final analysis, however, the house operates as a fixed access point or a point of presence on a larger community network which associates the inhabitants with a town, workplace and ordinary, everyday suburban consumption (Mitchell 2003, 47, 143) in an extensive networked infrastructure or field of presence (2003, 144-7,149,150,156). It is nodal. (The Internet-enabled refrigerator may well be a leftover from this era of futuristic development.) *1999AD* is noteworthy in its portrayal of early online interactive schooling and gaming for the little boy. He is doing schoolwork and using the computer to play chess in the film. Curiously, computer scientists working on interactive screens and programs often used children as the best example of a user because they represented the ultimate neutrality, bore little prior knowledge and represented the kind of user for whom user-friendliness would work best. (Kay 1977, 177) The film does not portray useful examples of wireless technologies, though it may be implied.

Experimental Urbanism, Mobile Housing, and Form

Architects of experimental space have long dabbled with the re-organization of social life around leisure, pleasure and community growth. An vision for technology to create change for the better and to solve social problems of architecture is apparent.(Cook 1970, 65) Early forays into the use of new technologies in architecture revolved around international collaborations between Western

Europe, Japan, and the US mostly. Robotics, interactivity, new materials, planning, biomorphic houses, and creative, personal mobility were explored. (Mason 2007; Cook 1970: 68 - 94) Numerous architects and theorists from the early sixties onwards worked on radically new architecture. In 1969, Archigram made a 16mm infomercial for the *Popular pak* to promote the idea of the *Popular pak* design or portable equivalent to buying a miniature, addable part of a city, boxed in pink packaging and available at supermarkets. (Archigram film c. 1969; Cook 1970: 120, 127-128) Peter Cook, from Archigram writes:

> …we are really discussing the possibility that architecture will dissolve into being an everyday consumer durable. The notion of the popular package of the optional extra (added to what is already there) will gain ground in the next few years. We are already familiar with many environmental supports that are credited with the title of architecture. These could be termed 'gadgetecture': they may be tents, they may be packages, they may be things you can knock down or fold up or unpack or combine into hybrids…at any rate, and they will necessarily involve your choice. (1970, 127)

Archigram, mentioned briefly in the mobile architecture section of Chapter 2, a British group whose name is the compound abbreviation of 'architecture' and 'telegram' collaborated on urban design and social transformation through technological means. Among other ideas, they created ideas for wearable technologies, worked with computers, networked space, and mobile technologies in their urban plans. They adopted mass produced architectural components already available and conceived as "add ons".

Pods and Bubbles, Small-scale and Portable Environments

Pod-like environments for the single user, reminiscent of the home office concept hawked by the computer industries as a spatial unit, also contained micro technologies.

> 'A few years ago it was common to build a strong floor to bear the weight of a computer which would be needed in an office; since then, the computer terminal has emerged as a small piece of desk top furniture. And it is easy to see the connection between the transistor radio---which can be held in the hand, or kept in the pocket and the person,

> contrasted with the treatment of the radio set forty years ago when it was a major domestic object. (1970: 124)

The consumer pod, sometimes mobile in its design, would be durable in the form of a 'man container' (Cook 1970, 116), or single person dwelling, and 'take up one's whole life support and communications gear and enclosure…and walk.' (1970, 117) The private electric car was a key possibility for these environments.

> The real advantage of the electric car is that it would give a piece of moving surface small enough to be intertwined with existing urban structures…the guided-home car offers the possibility of a moving satellite to the dwelling. It is only one step from this to projects such as David Greens *Living Pod* where a number of mobile satellite elements are contained within what is essentially a design of capsule derivations… (1970, 119)

François Dallegret's *environmental bubble* (1965), David Greene's *Living Pod* (c. 1968), Mike Webb's *Cushicles* and the *Suitaloon* (1968) were spaces conceived as capsule-like, personal environments. New technologies would be used to control the aesthetic, experiential, and thermal, and would accommodate individual needs for music, light and sound, differing, however, from the juke box, problematic, as a piece of technology, because songs were pre-selected. (Cook 1970, 119- 131,127; Mitchell 2003, 24) Pod-like structures would be made of inflatable, portable elements (and were often stackable), modular, and were sometimes wearable environments, and, even aggregated, or formed into mobile facilities. They could become libraries and schools (Cook 1970: 47-55; 119-122) incorporating durable, lightweight plastics and other materials influenced by space travel, and embodied the solitary, self-directed aspects of 'me generation' experimental consciousness. (1970:55-64; Ant Farm 1972, 2010) They often also entailed post nuclear survivalism, or assumed voluntary nomadic lifestyle, appealing to modern escapist mentalities and road culture. Vestiges of this nomadism lie in wireless shopping carts turned communications vehicles for wandering the streets (Teran, c. 2004, Zuniga 2004) and the communications needs of street people and the streetscape are embraced. *Headmap*, wireless art collective has used mobile

networks, waypoints and location-aware devices for Situationist derive and intermittent personal journeys in their nomadic research. (Headmap 2002) Marc Tuters, one of their most active members, has written and presented on networked publics, locative media, urban public space and sustainability, culminating more recently in *The Mobile City: Locative and Mobile Media/Urban Culture/The City in Amsterdam.* (The Mobile City 2009 www.themobilecity.nl, Tuters and Varnelis 2006; Tuters 2007)

Proxemics and New Technologies in Experimental Architecture

Mobile facilities and experimental enclosures of the sixties influenced the then new science of proxemics (Hall, 1965); a subject that has received recent renewed attention due to mobile communications technologies and public space. (Rosenbloom, 2009) Variations on the 'bubble' exhibit an architecture of personal control, electronic connectivity, and environments either stand alone, linked together, or stacked, Mosha Safdie-style, into aggregate communities connected by socially-oriented notions of proximity and community. '*Cushicles*', (Archigram) and 'suits' – *Suitaloons* (Archigram). were bubble-type, wearable experimental spaces that incorporated micro computing, multiple screens, radio transmitters, stereo audio equipment, or automatic dispensing and storage tools for water and food. These spaces, hypothetical and somewhat metaphorical in their conceptual design, ultimately were prototypes for how new technologies might impact physical architecture and revolutionize the human condition. Archigram alluded to this directly through representation in their media-oriented drawings, 16mm films and numerous installations and models for portable, mobile housing and cities.

Clothing and Bikes

Artists/researchers Katherine Moriwaki and Linda Doyle, University of Dublin, have prolific design research on the potentials of wearable technologies, exploring ideas of the body and communications, especially non-verbal forms of communication: touch, sound, smell, motion---and the technology in clothing as daily register of, for instance, climate and environmental conditions: sound, proximity, heat (light up mini skirts for dancing). They have created interactive designs for the expression of people in crowds during specific activities, such as clubbing.

(Moriwaki, Doyle 2004) (There is considerable other creative work in this area, but Katherine Moriwaki is really a forerunner of this work.)

Yuri Gitman's *Magic Bikes* project, while not wearable, incorporates antennae, laptops and small solar panels to make wireless Internet communications possible in temporary, non-networked spaces. The wirelessly-enabled bicycle points to the flexibility of wireless as critical to the development of urban communications space and points out the ease with which wireless connectivity can transform spaces habitually excluded from network systems. Gitman and crew created the first-ever Internet access in the New York City subway system, set up by *Magic Bike* instantaneously, as a stationary node or while cycling through the streets**.** (Gitman 2003: http://www.magicbike.net/ McKenzie 2004; Lee, 2003)

Walking

Ideas in experimental urbanism have been many emphasizing organic, if not ad hoc, organic growth in planning. Collective allocation of resources, use of contemporary technology, and alternative "green" means of transport and waste disposal are but some of the concepts which have appeared in experimental architecture, not that corporate design leaves them out. Organic form contrasts with the classicism and symmetry of Beaux Arts master planning and 'tabula rasa' mentalities of High Modernist planning such as Le Corbusier's Ville Radieuse plan for Paris. Robert Moses' developments, as he cut up New York to make room for freeways (Berman, 1982) are the master narrative elements of urban planning against which organic form was positioned. Organic form is a social philosophy that allows for growth in time with the events of everyday life, and to flow at its own pace, through its own 'metabolism'. (Cook, 1970, 77) This type of form making was widely explored in the late 1960s and early 1970s across Austria, Japan, the United States, England and most of Europe.(1970, 71-94) The Situationist city, *New Babylon* , built in model form by Dutch architect, Constant Niewenhuyes has received much notoriety. (Sadler 1998, Wigley 1999, de Zegher and Wigley 2001) New Bablyon attempted to be an incarnation of the Situationists' ideas of free play, mobility and poetic urban space. The design was a version of the principles of revolution in everyday life to which Guy Debord and others

adhered. (Debord, c 1967,Vaniegem 1969) *New Babylon*, as other experimental cities did, featured designs for 'mega structure' (Cook, 1970, 104)--- large, over arching networked frameworks similar to the planning of Yona Friedman. Friedman developed ideas of a structure which could 'move across any kind of terrain…and poise itself above already existing cities…' eliminating the fixed shape and planning of towns and cities as a constraint to new forms. (1970, 105) Collective housing, elevated walkways and ramps, and changeable modular components for living and playing with hint at efforts to address the consistent state of change in everyday life with a focus on humble, urban activities such as dwelling, entertainment, study, and circulation, as opposed to the huge ideas of historical planning per se. Renewable, environmentally sustainable, mega structural strategies, such as elevating pedestrians above transport systems, appeared in Friedman's *Spatial City,* 1969-70. In all of these cities, the 'problem of distribution' was the main issue. (1970, 105) By distribution Friedman meant, 'equilibrium between internal and external environment' and 'rational' conditions. (1970, 104, 105) Existing physical space was seen to impede the transcendental redistribution of social relations made possible by the mega structure Mega structures also posited walking or biking as preferable forms of mobility, in addition simply to theoretically invoking the specter of change as a design idea. Curiously, in wireless communications, independence from location and minimal intrusion upon the urban environment of the infrastructure, bears some resemblance to the concept of the mega structure which could be built over old existing space and allow activity to take place, regardless of pre-existing shape or location.

Computing as an Urban Infrastructure

Networked computing infrastructure is also a significant part of the 1960s experimental city designs demonstrating that architects of that time took seriously the future of computing as a cultural force. Computer City by Dennis Crompton (1964) investigates the potentials of computerized networks underlying future, fast-paced and automated cities. (Cook 1970; Costa Cabral 2002; Mitchell 2007) Plug in City (1966), a version of Computer City, and Vertical City (1967) by Friedrich St. Florian (Cook 1970: 72, 75) all looked deeply at automated, modular

thinking with respect to computerization. In these projects, social organizations for housing, schools and transport systems, relied on automated, flexible electronic and computerized systems which enabled forms of mobility, such as vertical transport (elevators and helicopters) and supported by modular, plug in thinking with respect to appliances, dwelling units, and in some cases larger institutional uses. (1970: 101) Plug in City, relied upon the mass production of identical modules in its architectural design, fore grounded a future of mass produced technologically-enabled units, habitable and exchangeable, and distributed systems which these units could be plugged into. This was, in essence a re-arrangeable, computerized infrastructure. This city would grow or dismantle according to need and shape of the organizational pattern required. Units, like LEGO, would be reconfigured and repurposed as new activities or needs emerged. It was an inherently flexible form of planning. (Cook 1970: 96, 108-9). One of the Plug in City's dwelling spaces, Control and Choice, demonstrates the need for personal control in these environments and the 'playing out of an interactive system'. (1970: 109-110) Interest in the infrastructure of cities has re-surfaced recently. (Varnelis, 2009). Interpretations of urban telecommunications infrastructure have been made by Stephen Graham and Simon Marvin in their an examination of urban events in which larger-scale developments slice up historic zones and impact on human events creating unique social forces that affect the form or logic of urban spaces. (Graham and Marvin 2001)

The Space of Flows: From Static to Mobile

The phrase the space of flows from Castells has been the buzzword of Internet theory and networked space for the last decade. It implies flows not vectors, a more subtle and local exchange. It implies flexible exchange of ideas in the commons and the many-to-many redistribution of social networking practices among all users of the networks. However, there are also technological reasons and purposes for this space of flows, which go beyond the sending of messages to the spaces of networks in which data is transferred and which have been impacted by technological improvements over the last ten to fifteen years, ultimately which are effecting the wireless space enjoyed today. The invention of faster processors, cross-platform contexts in

software design, increased storage capacities of most machines, TCP/IP protocols and, more recently, tiny USB storage units and ports name but a few of the changes having moved computing and personal communications from older, more inhibited space to newer means for transferring and mobilizing data. Powerful servers and high speed wireless, distributed networks, Internet enabled wireless devices and their infrastructure are nearly ubiquitous, moving and storing data as they go. Cloud computing and the remote storage of data, and operating systems now appearing on networks, also increase ubiquity and flexibility. These developments have created greater separation of communications practices from the location of access, such as workplace or home, and its forms of enclosure. They turn 'everywhere', providing the user, now mobile, has networked access, into part of the space of flows. This networked 'anywhere' is becoming a ubiquitous reality, but at the same time, distinctions between accessing data, and simply making phone calls or texting must be suggested.

Effects upon Workplace

An image of American skyscraper office space appears as a central location in Billy Wilder's classic 1954 feature *The Apartment*. In terms of workplaces and prevailing technologies, this image is of workspace before the invention of the Internet. In it, endless rows of uniformly equipped and same sized desks spread across the open floor of a modern New York office building. Jack Lemmon, hardworking, upward leaning, white-collar clerk, sits amidst a sea of identical desks. This vast interior, modern workspace, acting as a near character in the drama, expresses the culture of anonymity in corporate work relations then present and the excessive, productive order brought about by the adding machine and the switchboard operated, landline telephone. It celebrates the state of personalized, individualized telecommunications "modernity" at the time the motion picture was made. Each clerk works with identical tools can be located at the precise position of his/her desk constituting a uniform field of presence in which the clerks are voices at the end or origins of a productive machine. It is an image of technologically enabled post-material production in which technology is at the service of immaterial, corporate power; a one-to-one correspondence through the centrally-switched, networked desk telephones, all at

fixed locations, among a system of managerial monitoring and surveillance. This interior is clearly relevant to the openly planned digital work environments designed around cubicles in the 1970s and 1980s, also to Dr. Melissa Gregg's *Factory or Playground: Digital Labor Conference* presentation at The New School for Social Research, NY (2009) regarding the so-called flexible reality of today's digital workplace. In that presentation, Gregg screened images of workspaces divided into rigid, but, digital cubicles and queries how much as actually changed from earlier workplace designs, meaning their factory-likeness. In *The Apartment* following data is still quite fixed to the technology of the adding machine, printed tape, records of the worker, and an interoffice mail system consisting of modern, hydraulic tubes.

Post-sedentary Space and Loosened Data

In 'post-sedentary space' Mitchell writes, 'loosening of person-to-place contiguity' is the essential ingredient of separation for data and location. (2003:59-61) This process, since called diffusion of technologies (Townsend 2000, 1; Castells et al, 2007, 7-38; Mitchell 2003, 144), is essential to the 'anywhere' idealized by cyber space and to the use of networkable data as the basis of production.

Remote data storage is data storage on servers, which, in turn, centralize data, and make it accessible to anyone from 'anywhere'. This new relationship of data to location, the scaling down of server size and computer-size, made location-based computing (like the units of the Plug-in City) more capable of being utilized. Rob Probst of Hermann Miller designed units of furniture for flexible workplaces, or cubicles, to accommodate the changing needs of the corporate workforce as a result, primarily, of networked computing. (Hermann Miller, 2009) Also called workstations, cubicles allowed a private office-type space for each personal computer and its operator, telephone, and a personalized environment. In the early days of the Internet, a high-end computer (CPU) was often dedicated to specialized tasks that required more power than an ordinary desktop model. This workstation was often combined with specialized tools such as a scanner or was the one and only Internet access point for an entire business office. (Wikipedia 2009) Later, cubicles developed into Hermann Miller's groundbreaking modular office systems,

which included cubicle-type workstations, moveable partitions and ergonomic furniture; all accommodating high degrees of computer use by many involved in workplace production. Mitchell describes this period of transformation, which still included stationary, landed telephones, with exactitude and humor:

> …his telephone was physically attached to the cubicle; you could only call him when he was in…desktop computers, telephones and wired networks provided fixed points of presence…the cubicle farms of the era were grids of such points. As networks became faster and more sophisticated, and as more and more information moved from local storage to servers, it ceased to matter which cubicle Dilbert occupied…he could log in from wherever he happened to be…and he could have his calls electronically redirected…the new cube-to-cube mobility gave him even less opportunity to personalize his surroundings. (Mitchell 2003, 143-44)

Hermann Miller's newest ergonomic design, the Envelope (pronounced: En-VEHL-up) is form fit to the wireless laptop user, even to the extent that it exudes a lack of place, meaning, that it appears to be a workshop intended for the transient, mobile worker. It is so minimal that it does not have partitions and appears to be a computerless desktop.

Flexibility

Beyond data movement and the physical space of networked communications, has been demand upon designers to create labs for computer-based production. In film and animation industries, the art forms have been completely transformed from celluloid to digital operations. However, moreover, this newly networked, computerized production is now also, mobile. Employees, once tied to their cubicles through fixity, are now flexibly productive and can work from 'anywhere.' Portable data storage and remote servers, cloud computing, laptops, and mobile phones allow this workforce to move about freely and interactively. Computer-dependency, mobility, tenant turnover and changing corporate structures, are reflected in design trends such as spaces in open plan which reposition hierarchies of privacy and formality, placement of power points for laptop use, or height and placement of seating and lighting. Contemporary office design addresses the

need for employees to stand or stretch according to ergonomic and comfort requirements in relation to computers. Offices have also become increasingly informal and relaxed in style and floor plans tend to include combinations of private workstations (cubicles), semi offices, small interview rooms, conference rooms, and seating areas simply for a creative, internal change of environment. Herman Miller Design (www.hermanmiller.com) research on productivity in relation to personal computers has been one of the driving forces behind the development of everyday ergonomics in relation to computing. Design development has also emerged, also, around the higher-resolution, more ergonomic and space-saving flat screen monitor, for use with desktop machines.

Mobility in the Workplace

> By selectively loosening place-to-place contiguity requirements, wired networks produced fragmentation and recombination of familiar building types and urban patterns. (Mitchell 2003, 144)

Cubicles were an initial response to networkable data and the personal computer, but wireless mobility in office interiors, because of remote data location, Bluetooth, and similar wireless transmission and technology, including powerful handheld devices, detach employees from desktop workplaces, and production from specific locations, largely. From the perspective of corporate industries, the unification of workplace relies, often, more upon brand identification and ownership of the remote mobile device than it does the presence of workers in the office. Castells et al devote a significant passage, as well, to changing workplace relations, workers operating away from the office, and how these new relations benefit corporate power. (Castells et al 2007, 78-82) The point at which gross decentralization of data and mobilized, computerized processes intersect with urban space, is one place of the hybridization associated with mobile social relations. The Automated Teller Machine, for example, could be construed as a phase of distributed banking, which also includes online banking and more recently, mobile banking.

Digital Work and the Home

The culture of computerized production has developed amidst shifting boundaries in the space of

flows. Increased monitoring, surveillance, and self-monitoring of personal behavior around online communications among employees is one outcome. Changing spatial make-up of Internet use, moving between home and work, has brought about combinations of personal and business communications, mixed use of resources, and blurring of place and identity. Doing email at work, for example, email misuse, and the monitoring of email time at work, became an ongoing issue for both employers and employees, starting in the mid-nineties when personal computers began to be common. (Baron 2000, 227 in Pratt, 2006). As concepts of digital work accompanied the digitalization of culture and sources of paid, flexible work became available, telecommuting created greater blurring between out of work life and working life. Both telecommuting and flexible work meant not having to commute physically. In fact, the very nature of work was under scrutiny:

> One version…was a concept of home telecommuting; the cubicle might become a study in a suburban house. Another was that of the electronic cottage…another was access to rural labor markets…and another was motivated by urban workspace costs; employers realized that they could save on rent by relocating employees…while saving [due to networks] on commute time and costs. (Mitchell 2003, 152)

Moreover, corporate headquarters moved to areas where land was cheaper and overhead lower. These strategies [meaning relocating workers or focusing on urban workplace costs] merely substituted one fixed workplace for another, forcing a tradeoff between them. (Mitchell 2003, 152) For some, however, personal computers have meant independence from conventional workplaces. Paige Edley, a Lecturer from La Jolla University demonstrates how single mothers and two parent working families in the US have used home computing.

> 'Reasons for working at home are flexibility, the desire to be one's own boss, and wanting to spend time with one's children' and 'control over their schedules' (Edley 2003: 261 and Hull, 1994; Jurik, 1998; Rodgers 1997 in Edley 2003, 261)….'allowing women to challenge traditional patriarchal business systems'. (Goffe and Scase, 1985 in Edley 2003, 261)

If direct economic gain from owning a personal computer were achieved, then greater freedom and flexibility in terms of how one could create a successful, self-styled work environment would become an incentive. The digital workplace was only *just* being defined through the choices made by industry and computer owners. Mitchell writes:

> As the capabilities of wired telecommunications networks developed and their service areas expanded…there was increasing speculations that telecommunications might substitute for travel within this sort of urban structure – (If Dilbert was isolated in his cubicle, it might not much matter where that cubicle actually was.) (2003, 152)

Telecommuting started as a substitute for having to commute to work. The home computer became an extension of workplace and work place production without going anywhere. They were as mini-centers for the provision of individual services, and even innovations, offered by their owner. Ruth M. Davis, a computer industry magazine writer of the time, states, 'the phrase "electronics and computers for individual services" describes a broad field and would not convey the same meaning to different individuals.' (Davis, 1982, 853) She continues…'when the products of a new technology are affordable to many individuals and are open-ended in their use, they fire the imaginative spirit of individuals and we see a surge of innovation.' (1982, 853). Computer scientists and industry pundits saw computers, as a tool for personal use, as revolutionary unto itself.

Myths of Transformation

Computers, seen to have the capacity to mimic humans, were 'intelligent machines' of the future…computers that…can imitate man through movement, speech, and most significantly, thought processes.' (Brand 1973, 11) Personal computers were quickly morphing from a service-oriented word processing instrument tying them to conventional work processes to becoming a powerful multimedia tool, eventually to carry audio, video, photographic processes, burn CDs and, then, CD ROMs as well as to perform networked communications. New practices, ideas and income emerged as a result. It is worth noting that 'multimedia' has been criticized as an American idea, relative to American interests in the entertainment industry. (Notes of the

author)(Notes of the author, 2004) Working with computers meant investing in the transforming computerizing economy, one reason it was somewhat slow to catch on in critical circles. Many thinkers in the mid-1990s criticized the virtual life attributed to cyberspace. (Boal et al, 1996) The structure of independent work, in particular, often entailed choosing how to work with networked communications. This was the creative side of the new flexibility, a state of economic and digital transformation perceived as unclear and somewhat culturally unstable. Computer scientist, Alan C. Kay writes, in an acknowledgement of this period of technological history, 'The interaction of society and a new medium of communication and self-expression can be disturbing even when most of the society's members learn to use the medium routinely.' (Kay 1977, 243) Moreover, there were negative responses to personal computers. Typical tendencies in the computing revolution were described in the following way:

> …The user has a strong motivation to emphasize the similarity between simulation and experience…feelings of power and a narcissistic fascination with the image of oneself…from the machine…to employ the computer trivially simulating what paper, paints and file cabinets can do…as a crutch, or as an excuse…blaming the computer for failings…more serious is the human propensity to place faith in and assign higher powers to an agency that is not completely understood…' (Kay, 1977, 244)

Despite recognition of computers affecting all facets of life for better or worse, the inherently powerful capacities of personal computing, including arithmetic calculation, networked communications, simulation, and storage were indisputable and they offered much, as Davis argues above, to the imagination and to potentials for making an income, digitally.

By the early 2000s, however, according to Mitchell, it seemed clear that telecommuting would not work on any meaningful scale (2003, 153). Saving on travel costs or office rent, however, was not the only justification for doing it. 'Childcare opportunities, comforts of home, scenic view from home, and flexible hours' were all reasons to trade conventional workplace for 'home work place'. (2003, 153) Potential user markets could now include a diverse group: elderly, parents, school age children, and women. Moral panics, less utopian than flexible work were also

pervasive, even in San Francisco, where personal computing was popular. Skepticism towards the computer industry, omnipresence of screens at home, at work, in public space, and fears of surveillance were raised. (Notes of the author.) Health concerns from microwave radiation were an issue in many cultures. (Sutherland 2007)

Gender and Digital Divides

The utopian promise of home computing and access was also significantly more difficult for the average consumer to enact than one might assume. Age, class, education, ethnicity, and gender often stood in the way of computers becoming widely accepted. Unmarried women scored significantly lower both on ownership at home and on use at home, than did either higher educated men or lower income married and working women, between 1983 and 2000. (Losh 2003; Nie and Erbring, 2000) Lower income workingwomen used computers at work almost as frequently as men; though in the 1980s men were eight percent more likely to use them at home. Men, however, were more likely to use their computers for higher-level tasks than for the word processing and data entry attributed to women in the workforce. In the Nie and Erbring study, the findings are based largely on the labor force. Gender discrepancies arose partly from the fact that male college students were more likely to enroll in scientific courses where higher level information and data tools, thus *computer skills*, were perceived as necessary. Women were less likely to major in architecture, mathematics or economics, for example. From 1983 to 2000 the gender gap remained nearly the same, while home ownership of personal computers increased steadily across populations, with the greatest gap closing in the region of high school aged youth, both male and female. (Losh 2003)

Personalization: Computers, Telephones, and Markets

> [The microchip]…it is powering the Internet Age, the next generation of high-speed digital communications, satellite transmissions and multifunctional wireless handheld devices and continues to enable increasingly complex, more reliable and cost-effective electronics. (Texas Instruments, 1995-2010)

There is no doubt that it was the shrinking of the computer "brain" to the size of a postage stamp

which brought about the possibility of small-scale machines, individual ownership and the development of even tinier computers and parts. The constitution of digital culture has revolved around personalization, or the miniaturization and customization of new technologies fitting comfortably with human scale, and notions of "user friendliness" designed into, at least, Macintosh Apple products. Meshed with the development of micro electronics and miniaturization of larger components into small, self-managed systems (Kay 1977; Texas Instruments 1995-2010) personal computing has been presented to the public under Macintosh Apple's pervasive rubric: user-friendly design. Such a powerful, comfortable campaign helped to make personal computing (Mac brand or not) increasingly accepted among a wide variety of users. It helped to dispel moral panic around the impact of computers and automation upon publics. It helped to dispel the idea that special expertise, as opposed to literacy, was required to use a modern computer. User-friendliness provided a metaphor by which made computing, with its auras of business, mathematics and scientific use became a more accessible idea. User friendliness helped to debunk the more scary perceptions of computing machines, such as their potentials to be abused by authoritarian control. *Metropolis* (1937) and numerous subsequent science-fiction films, including Kubrick's *2001: A Space Odyssey* (1968) and Tony Scott's *Enemy of the State* (1998) have exploited the darker side of computers. User friendliness is a specifically held set of beliefs about the personal computer in contrast to this dark side. Macintosh/Apple's components, images, interfaces, metaphors, and software are designed to avert, through the ideology of 'user friendliness', dark and scary associations with computing. The Mac Operating Systems from early Mac Classic, with its black and white only, harder-edged friendly 'little Mac guy' on the screen to the more recent Aqua-based blobby, watery blue appearance to the desktop (with three-D blob buttons, and bouncy icons) is a lengthy history of user friendly design. (Wikipedia 2010) Doug Engelbart, designer of the first mouse, also transformed real keyboard interaction into the virtual 'point and click' something which has transformed into something a bit more like pneumatic poking with the blob-like interface. (Notes of the author, 2010) Textbooks, written "For Dummies" emerged to softly meld expertise with ignorance and fear of machines. The globally distributed, award-winning Think Different Mac poster and campaign (c.1997)

combined famous artists and thinkers (Einstein, Maria Callas, Frank 'old blue eyes' Sinatra, Jim Henson and Kermit the Frog, Bob Dylan, and many others) with Apple products to suggest ingenious, moral and artistic connections. (Wikipedia 2009) Movements to sex up the grey appearance of computers emerged with pretty, translucent, blob-shaped iMacs, available in six colors. These very different, popular machines brought in an era of design of non-computer-like computers from which the 'iDog' (musical dog-shaped soft computer held in the lap) is one example and from which, arguably, many new laptop designs emerged globally, including those with colorful cases, tiny Mac Notebooks, and currently, the iPad. This ongoing push to disappear the machine-likeness of the machine, to transform its identity to consumers, and at the same time to sell something more powerful, is clearly the clever marketing of obsolescence, but it is also an effort to diversify into new, non-technical markets: children, women, fetishists and style conscious owners wanting the latest "thing." This takes over in the gadget era. Arguably, however, with the shrinking and deployment of better memory, particularly in the form of peripherals which can enhance older machines, the computer industry is, actually, selling something better, not just something which looks like eye-candy. Overall, the degree of effort to allay any fear of technology, or to dispel its connection to male-dominated fields, has helped to increase ownership, particularly among women and families. The entire process resembles the process of personalization surrounding landline telephones, at one time the province of businessmen linked in to switchboard operators, and then objects almost entirely associated with users, particularly female, in residential space. The nearly portable Princess ™ AT&T phone, designed by Henry Dreyfuss in 1959, were designs pitched to teenagers and housewives:

> It's little, it's lovely, it lights…the desk set gets a whole new look…Compactness, attractive styling and illuminated dial…contributes to the all around usefulness of the PRINCESS telephone…and it comes in white, beige, pink, blue and turquoise. (AT&T poster, 1959)

Macintosh user-friendliness in design has been employed to disengage the image of the computer from its former elite aura and to transform the personal computer and all its associations into

something attractive, convenient, challenging, controllable, and above all..."personal." In the case of computers, it was the dark science fictional side and any elitist (private institutional expertise) conceptions still attached. (Davis 1982, 853)

> If the computer is to be truly 'personal', adult and child users must be able to get it to perform useful activities without resorting to the services of an expert.'(Kay 1977, 231)

Marketing towards 'a wide range of useful activities invoked with little or no knowledge of programming', for instance, early education in personal computing involved introduction to 'SMALL TALK', [an interactive game]. 'SMALL TALK worked by getting them [users] to send messages to already familiar and recognizable families of activities; the family "box" [a game of squares] was redrawn digitally'. (Kay 1977, 242) Designs have continued to appeal to family markets, wresting the computer's past identity as a complicated, practical and scientific or mathematical tool, to that of an indispensable commodity for both learning and entertainment. The computer has become an essential component of the home entertainment center, often, occupying its own space in the interior, a prominent space in the living room, or is combined with a flat screen TV. (Sony Google) Beautifully-designed gaming platforms, music applications and online news resources are shared media resources, interactive to more than one player/user, and require large visible monitors for best use.

Individual Ownership as the Ultimate Point of Sale

Writing from Xerox Parc, Palo Alto, 1977, computer research scientist Alan C. Kay stated:

> In the 1980s both adults and children will be able to have as a personal possession a computer about the size of a large notebook with the power to handle virtually all their information-related needs.' (1977, 231)

Personalization of media through computers has been, above all, governed by the idea of personal, individual ownership of the personal computer and its attendant gadgets. Selling individual communications power and distributing the reach of computing deep within culture, and across the globe, is an historic diffusion of media empowerment, capitalism, and industry that

has also created, fostered, and profited from new relationships made possible by the addition of the Internet. In terms of personal telephones, these commodities have moved from being shared among townspeople (turn of the twentieth century) to being shared within wealthier households and businesses (first half of twentieth century). From there they have moved to being owned in single family homes cross culturally, and to be capable of long distance calling (post World War Two) and forming the basis of the Internet (landline wires). Now they have become mobile and personally, individually owned by every member of a single family old enough to operate one. Startling statistics on mobile phone ownership, across all countries, are in the billions worldwide. Equally amazing statistics about their disposability---approximately 126.8 million phones per year are disposed of annually in the United States. (Electronic Take Back Coalition 2010) In a recent report by Nielsen, it is estimated that 20% of American homes have no landline. (Hansell 2008) Market-hype, affordability and accessibility, with easy trendy, replacement, huge constituencies of intimate tech support and a slew of changing functions make this kind of ludicrous ubiquity possible.

Perspectives are offered on this personalization as a fundamental social condition and context for mobile technologies. The first is the pleasure of personal ownership afforded by relatively inexpensive yet powerful connectivity and the convenience of the mobile device. Secondly, sophisticated customization and creative personalization of the tools, the cell phone being dressed with a selection of stickers, for instance, favorite songs and play lists being unique to the owner, tiny character "friends" and totems dangling, the entering and storing of names and numbers and separation of "favorites" from others is integral to engaged mobile culture. Cell phones [and now more sophisticated gadgets] are 'adapted for a wide range of social practices, in addition to the main function of communication, (Harrington and Mayhew 2003 in Castells' et al 2007, 77).

> Consider for instance, the address book that is often sorted only in the mobile…nowadays there is no need to memorize phone numbers…if there is a failure of the address book function, or the mobile phone is lost, the owner of the handset will be seriously disabled…. (Castells et al 2007, 77-8)

Personal data embedded in the Subscriber Information Module or SIM chip (Townsend 2000, 6, 7; Hjorth 2005) becomes all the more meaningful when lost. Likewise, multiple SIM chips, each one for a different carrier, are stored in the back of the phone and switched over. can be owned. The instrument's display generally identifies the caller before answering, making answered or unanswered 'recent calls' and 'voice mail' a means for retaining information. (Notes of the author 2010) Personal computers and laptops have also, historically, been decorated and modded to enhance their appearance and to personalize the case, the desktop "screenie" as well as through options and email identities. A third perspective in Townsend's 'urban metabolism' or the scaling down of (and resultant speeding up of) urban activity through cell phone use is the reiterative and recursive aspect of cell phone use. (Townsend 2000, 1). Cell phone activity includes reiterated, intimate senses of being co-present (discussed in Chapter 1) or recursive communications practices which contributed to embodiment and place making. (Hjorth 2005, 1) Personalization creates strong connection with self and community, while user friendliness is a trademark of the Macintosh brand.

User friendly Mobility

Mobile devices have had a schizophrenic history, never quite being capable of doing all that consumers wanted. User-friendliness, however, exemplified by the iPhone and other devices that stand in for so many consumers needs as to substitute, in a sense for the mirror, also take away the look of the "box". These elegant, multifunctioning tools have superseded the limitations of the personal digital assistants of the mid-nineties. Advertising of iPods has them appearing wet and gooey, in nearly edible colors. The telephone that was not to look like a telephone is now the personalized, colorful mobile device, custom encased to match a life style. Personalization thus conceived is a process of increasingly user-friendly associations and adjacent capacities, connecting the handheld tool to the user through the body (size, touch screen), through personal style (case, brightness, ring tone), non proprietary markings (stickers) as well as, the perennial customizing performed through brand identification (are you a Mac person? Or an IBM?) giving the object the powerful signification of community. Ultimately, profound, uniquely individual

personalization exists in electronic traces of data inscribed into SIM chips, music storage, or, the singularity of an "app" collection.

Home Computing

Home computing was as important to the 1980s and 1990s, globally, as domestic television was to the late 1950s and 1960s throughout the Western world, and for similar reasons. The power of the screen to fascinate; the availability of information to be used; and the idea that without them, one was living behind the times were all remarkable selling points. These networks, based upon existing landline telephone infrastructure for their telecommunications support, were quickly implemented. Discussion in this section of the Chapter, turns to the complex intersection of computing and online communication in residential space; the combination of home computer or laptop, home gaming environment (multimedia software), Internet access, landline phone, television set, and increasingly, powerful mobile device(s) which make up a typically immersive, residential media environment. This environment either is used by all members of the household in a shared fashion, or together simultaneously for the enjoyment of media culture, or is one of several individual, environments, in that each user has their own equipment and set up. Depending on what part of the world one looks at, home computers are more or less prevalent. In San Francisco, most households had more than one computer by the late nineties, while, in Australia, where electronics are substantially more expensive to own and the Internet more expensive to access, multiple home computers in Brisbane and Melbourne, were less common at the turn of the century. A noticeable climb in computer ownership took place between 2000 and 2004, with households having more than one computer, or more likely, individuals buying laptops for personal use. (Notes of the author) Home media environments are usually centered on a computer, although better resolution, flat screen televisions are now appearing with built in computers, and the home screen is getting larger. Their function is, first, as a connected arena for online culture and as platform for hard copies (DVDs, CDs), personal self-communications, and, finally, as an information link to the outside world. Indeed, definitions, directions, medical information, photographs, maps, recipes, travel information, translations, music, films and videos,

and weather reports—all useful to the happy, smooth running of a household or as entertainment--can be obtained from the Web and/or played back easily from most contemporary personal computing set ups or laptops.

It is already a well-known and established fact that important relationships exist between individuals and households, households and neighborhoods, neighborhoods and cities. Clearly, processes of technological establishment in residences across cities are observable. This establishment involves insinuation of new technologies into dwelling space and, more importantly perhaps, into the architecture of cities. Landlines for the Internet, T-1 and DSL lines, and now high rooftops, have become the groundwork for installation of networked infrastructure tying together the wired with the wireless world. Barry Wellman's essay, 'The Rise of Personal Computing' (2001) forms the basis of study of effects of the personal computer and online communications on households and household relationships in this section. Wellman's Neville study is also a paradigm of social research in this area. It also looks similarities in the particulars of residential computing as a social phenomenon across Western cultures.

Residential Computing

As an evolving enterprise, personal computers installed in residential space have shifted in meaning from being extensions of the workplace itself, to being sites of at home digital work, to being companions for pleasurable listening, viewing, gaming and self-empowerment. Through lowered cost, greater literacy, software development, diversified creative products; global network development and exchange, a multiplicity of new relationships have been made globally. Home computers, owned and operated in residential space, in the "home office" for purposes of individuals, have had huge significance as a force of communication in the late eighties and early nineties. Writing in 1985, Australian media theorist, Trevor Barr, in his paper 'New Networks: Culture, Content and Cables' notes that the concept of 'home offices' enticed prospective Australian consumers of personal computers. Indeed, the Australian Internet began to flourish in the universities and to expand independently at about this same time. (Goggin 2006)

Wellman's Network-related Sociology

One of the great writers on computing in residential space is the eminent sociologist, Barry Wellman, whose research is both groundbreaking in its subject matter and technologically optimistic. Wellman's focus on residential computing and the study of online communications in particular, stands out as about the social space of technology. For example, Wellman observed users staying at home more to compute, as well as other factors aiding and establishing home computing practices, such as distribution of ownership between household members and affect upon married couples. In an early paper on networked cities (publishing with Paul Craven, 1973), and in more recent case studies, Wellman argues that computer mediated communication reinforces 'complex social networks' which 'have always existed' (Wellman 2001, 228). 'The human use of these technologies is creating and sustaining community ties.' (2001, 228). He observes elements of both portability and wirelessness among his findings.

Households are the critical spatial unit of residential neighborhoods. Beyond that of shelter, he argues, households have specific symbolic and practical purposes. In the nineteenth century, for example, their main purpose was as visiting center, precluding the need for, or importance of, other gathering spaces:

> 'Door-to-door' to 'place-to-place community relationships…driven by… transportation and communications. It was a move…to contact between people in different places and multiple social networks. Households became important centers for networking; neighborhoods became less important… (2001, 228)

New forms of communication in the nineteenth century, such as better message delivery, the calling card, or even early telephones, made visiting that much simpler. Gatherings became more interiorized, including more women and young children as a result. The invention of better transport, trolleys and trams, fostered social networking between households at further distances away. The telegraph (the Meet-up of its day), in addition to the trolley, taxi or other vehicle, supported cross-city interaction. (Carey 1989; Wellman 2001, 233; Tarr 2002). Communication, having thus 'broken loose from the need to be carried somewhere by someone' meant that

community could go 'beyond the neighborhood' and extend to different locations. (Wellman 2001, 233) Wellman's later arguments address the domestication and subordination of community to privatization at that time: 'home is now the base for relationships that are more voluntary and selective than the public communities of the past.' (2001, 234) Of the state of communities and wireless connectivity he writes:

> The shift to a personalized, wireless world affords truly 'personal communities' that supply support, sociability, information and a sense of belonging separately to each individual. It is the individual, and not the household or the group that is the primary unit of connectivity... (2001, 238)

Organization(s) of Society

The social structures of societies have become organized around individuals in networks, not around groups or masses. (2001, 227) In the networked society, the masses do not exist as they did through the nineteenth century. There is today, in fact, a post mass concept of the individual and society, one which is networked, non-geographically defined, and which develops in a space of flows and distributed creativity. Networked society, based in the power of computer processors and TCP/IP protocol to distribute data, now increasingly mobile, is decentralized, individualized, and ubiquitous. Wireless technologies increase this capacity of communications to diffuse. Networked society has evolved to exist in its own spatial dimensions, without walls, without fixed locations, as cyberspace, and now with mobile media, to possess new characteristics. Some form of electronically mediated networked space, cellular or wirelessly driven, computer-driven or not, has become accessible to [nearly] all. Wellman writes:

> The proliferation of portability will be both the embracing of ----and the negation of ---- ubiquitous globalization. Computer-supported communication (CMC) will be everywhere, but because it is independent of place, it will be situated nowhere. The importance of communication site as a meaningful place will diminish even more…the person --- not the place, household or workgroup --- will become even more of an autonomous communication node. (2001, 228)

He goes on to argue that communities are 'networks of interpersonal ties that provide sociability, support information, a sense of belonging and social identity'. (2001, 228) He concludes that non-location dependent communications affect the meaning of place-based communities. In his study of Netville, a residential apartment complex, home computing creates new patterns of domestic organization and working relations between couples. Home computing contributes to new patterns of interaction and proximity in the dwelling and with respect to the community around it. (2001, 235-7) '[Communities] are truly cyber places, and not just cyberspaces' both Wellman (and Howard Rheingold) have asserted about the overlap of physical with virtual space. (Rheingold, 1993; 2000; Wellman and Gulia, 1999) In the Netville study, (with Keith Hampton) published in 2003 under the title, 'Neighboring in Netville: How the Internet supports Community and Social Capital in a Wired Suburb', researchers examine experience: highly local communications networks, the ties communities of users make to the outside world, and the formation of online communities in this context. Wellman's work on cyber place focuses upon how communities, engaged in home personal computing (which is place-based and has the density of an apartment complex) form bonded relationships between themselves, online constituents, and each other as neighbors.

New Technologies and Non-geographic Community

Wellman's published research evokes some of Melvyn Webber's writing on the developing concept of urban 'non-place' among the post-World War II American professional class as a result of more widespread domestic and long distance telephones. (Webber, 1964 in Graham 2004) Webber's contribution was 'non geographic' concepts of communities which recognized the effects of telephone technology upon communities engaged in networked communication. He observed the emergence of urban non-place as a virtual, non-geographically specific realm of urban life, and as a changed condition of communication in towns and cities, which had relied more heavily upon face-to-face interaction. By defining non-geographical community because of long distance telephony, and noting the 'interest communities' that emerged, Webber makes the assertion that long distance telephony, prevalent in post war America, along with cheaper airfares,

affected place-based communities and fueled the development of dispersed communities of interest. These communities then became a valuable social unit for thinking about communications design and architecture. Indeed, parallel developments are visible with respect to the Internet and the rise of mobile communications.

Personal Networking

Barry Wellman's work has gone a long way towards defining the rise of personal networking as a late twentieth century activity that has arisen because of the Internet-enabled personal computer. Wellman's notions of personal networking bridge physical space, largely through the spatial unit of the home office, which at the time of this research was fixed and nodal (i.e. not mobile) with respect to the Internet. He writes: 'Because using the Internet is so immersive…residents use it heavily at home. Family members help each other use computers, share on line discoveries and replace time spent watching television with net surfing.' (2001, 236) The home office was thus a "building block" of networked urban space in the personal computing era of the nineties, and helped establish relationships between interior and exterior boundaries where cyber communications and communities pass. (2001, 234 -9) Wellman also argues that computer-mediated networks help maintain communities otherwise dispersed. Ultimately, this home use results in the establishment of cyber place, a term apparently coined by Wellman. As dwelling space and residential life began to be augmented by personal computing, this place-based aspect brought users home and, therefore, into closer contact with each other and their surroundings, reinforcing, as it were, proximal relationship important to residential well-being in apartment complexes. (Note: The density of Netville's inhabitants in the residential complex makes it relevant to urban studies.)

Personal Computing and Television

In Wellman's sociology, personal computing is a more powerful interactive technology than domestic television. Computing activities, he argues, bring families and couples into closer 'in home' relationships, and the interactivity and mediation one can achieve with online communication is more immersive and comprehensive. Personal computers shift the emphasis to

'involvement in communities of shared interest', which, in turn, includes 'more spatially diverse' relationships because there is 'greater connectivity between communities and across group boundaries'. This means greater exchange held within non-geographically defined user groups. (2001, 234-39) Online communities tend to give users 'strong interpersonal feelings of belonging, obtaining important resources and having shared identity. (2001, 234-39) Communities have also been successful in home computing networks because households operate as bases from which to conduct computer-mediated social networks, thus people take more interest in their surroundings. Operations of the social network (presumably by personal computer and telephone), connectivity with communities in larger numbers (email, bulk mail, news groups, online communications), and participation in online groups can happen from home, in one's neighborhood or building. (2001: 234-39)

Wireless Technologies and Home Computing

With the addition of wireless communications, these in home practices may once again be changing. Mobile communications may be affecting proximal relations by changing the frequency with which the home is used to compute or even, make calls. In the United States, a hugely significant change in telephony has occurred in general, since 2000, and that is one cost per month for national long distance. This fosters an increasingly affordable possible realm of conversation, equivalent to the cost of email. Mobile web applications also decrease the need for use of a fixed computer and create more separation between users in a residence, when each has a personal handset. Finally, mobile, wireless culture has the peculiar attribute of making anyone on the street with a cell phone, visibly and audibly connected to someone or something. The market audience has the feeling, amidst pitches about "family and friends", that community is more transparent and omnipresent.

S.4 - Wellman's Observations on Benefits of Personal Computing and Networking in Households

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Note: Each observation of Wellman's is followed by a reflective analysis on the development of network 'reach' by the author. (Observation summary found in Wellman 2001, 247)	
1.	In the short term, personal computing has made the household more important as a base from which to operate one's computer-supported social network. This can lead to a rise in 'neighboring', as home-based people take more interest in their immediate surroundings. §Localized network, pre mobile wireless observation; does not address questions of laptop use, or non home computing; increases value of home
2.	Jointly with the mobile phone, personal computer use emphasizes the ascendancy of person-to-person community, contributing (along with other factors) to the de-emphasis of domestic relations. § Local community-based and individual social networks, perhaps more community outside of home and less reason to develop 'cyber place' not just a de-emphasis on domestic relations.
3.	[Personal computing] has emphasized individual autonomy and agency. Each person is the operator of his/her personal community network. § Local community-based, long distance, global, non-geographically specific and self-empowerment
4.	[Personal computing] has afforded greater involvement in communities of shared interest. § Such communities have become more spatially dispersed, online, global, non-geographically specific; connected to other powerful media such as TV, movies, radio culture.
5.	[Personal computing] has afforded greater connectivity between communities. The ease of communication to a larger number of people facilitates ties that cut across group boundaries.

	§ Non-geographically specific
6.	Online relationships and online communities have developed their own strength and dynamics. Participants in online groups have strong interpersonal feelings of belonging, being wanted, obtaining important resources and having a shared identity. § Online, global, non-geographically specific; non-place dependent community

Household as Unit of Analysis

With the advent of mobile wireless, the persistence of the household enclosure as a space for computing may well change. Households of the twenty-first century may not be as significant, as Wellman's study makes out, given that new mobile media devices and faster speeds afford us the ability to access networks, email and perform personal micro management on the go. Nevertheless, other factors related to the household are important, including the presence of mobile communications as a replacement for computers, and the persistence of digital divides. One effect of on household computing, which has increased, is computer time devoted to entertainment, often more intensely utilized than television due to interactivity of online multimedia and gaming. Online participation and activity has been increasingly encouraged as part of media consumption. This would include by television news, newspapers, and the space of play where 'social and participatory activities have increased immensely due to new media technologies' (Lauwaert, 2009, 130). Synthesis of media form and website, as a central part of the media consumption of the modern household is a growing phenomenon of the twenty-first century digital culture. However, there may be significant differences in consumption as well, which are local, urban, regional, national, and international or global.

Sharing Space and Cell Phones

A share house is a good, localized example of a community in which cell phones, for example, benefit a particular social organization and take over for the older single telephone line. The share

house tends to foster communal activities among "roommates" including paying bills, but personal lives are very separate. Cell phones assist in collective management of both the transience occurring in a share house community, and the convenience of having more than one line. Cell phones offer a way out of dissecting the landline bill between parties and create privacy for each user. Wellman's observation of de-emphasis on domestic relations, where cell phones afford couples greater independence and personal privacy, is a cultural difference based on type and social organization of the household. (Wellman 2001, 239) Statistically, cell phones give women greater independence, though not in cultures where traditional issues of gender and patriarchal control persist. (Castells et al 2007, 42-47) 'It affords liberation from both place and group.'(Wellman 2001, 239) Wellman's research shows mobile communications have a positive, libratory effect on the experience of self where new possibilities for social networks occur. It is important to qualify this with the fact that the Netville study took place in an upwardly mobile, moderate-income community of well-educated residents in a suburban complex. Usage in other kinds of housing might have different emphasis. Lastly, quality networked computing is fast, improves all kinds of social organizations and contributes positively to the strength of domestic relations (disputes over monthly gaming fees aside), especially when members of a household share interests and share the online culture of communities of interests. As a culture of media, like any other culture of media, online computing combined with mobile media is about bonding and interaction.

Cyber place and Mobile Place

> Atoms – things --- as well as bits---computer-mediated communication --- connect us. Spaces continue to be places, where in-person meetings or passive observations provide tangible sense of personal identity, a feeling of community, readily available support in the form of goods and services, and a literally concrete sense of the past and a future (Casey, 1997; Orum and Chen, 2002 in Wellman 2001, 252)

Place has complex form when it comes to this discourse. It is physical with respect to landline wiring which requires even a liminal architecture. Land and telephone lines are a physical

armature for wires, as are the fixed locations of households and architecture through which they connect forming a spatial arena for communications. These physical, place-based networks are, arguably, bounded and situated geographically, even when dispersed. They still exist spatially in places.

With wireless, there are no wires. Place for communication can be anywhere, as long as the end-user device, antennae, and bandwidth are present. Infrastructure is smaller, less intrusive, more sublimated, attached to tops of buildings; discreet. Landline telephone poles match the liner direction of streets. Cell and wireless antennae are put up high, out of sight.

Place-based meaning persists, however, between co-present spaces of callers. A sense of personal identity, feeling of community, literally, a concrete sense of past and future, emerges for users. When traveling, having a local telephone number for a mobile phone, anchors the traveler to the foreign place.

Likewise, personal mobile telephony, links unlikely spaces together. The 'anywhere' of myriad locations from which to transmit is part of a pattern of private communications emerging with mobile networks. This data, in turn, can be visualized and read. SENSABLECities Media Lab at MIT develops data visualizations of such citywide usage. Mobile communications space is infinitely traceable in this mobile data mapping.

Other aspects of mobile place revolve around social mores and appropriate usage. Mobile devices tend to fuel discomfort about their abuse, misuse, and privatization. McKenzie Wark describes the 'cancer of cell space' thus:

> Social space just is not social any more, now that anyone can "privatize" it with a cell phone. At the most recent SIGGRAPH in New Orleans, a dot commer was overhead taking no less than four cell calls while ensconced in a toilet stall. There is no space you cannot turn into a space built just for two. Not so much for you and the person on the other end of the line, as for you and your cell phone. (Wark 2000)

Wark points to the potential for cell phone space to become more blurred as people move into

public spaces with their mobile gadgets. At the same time this moral panic, may be subsiding as mass ownership of gadgets takes over and the instrument is not seen so much as one of business, but one of intimacy. Place has and will develop new meaning precisely because of locative ideas, mobile media, and the presumed dis enclosure we experience due to wireless, context-aware, and mobile telephony. If anything, since 2000, public and private have been 'renegotiated'. (Wilken 2005, 1)

Public Computing, Gender, Technological Cooperation and Online Diversity

During the 1990s, the globalizing Internet grew approximately one hundred percent per year with explosive growth in 1996 and 1997. (Coffman and Odlyzko 1998) Recognition of the value of personal computing and the Internet emerged quickly, bolstered by the support of artists desiring computer literacy and ownership around the world. In an increasingly corporate United States, the Mission District of San Francisco, a multi-lingual, multicultural working class and poor people's neighborhood, rated the third best place for an artist to live in the US by the Utne Reader, (Notes of author) the need for computer literacy was felt profoundly. Diversification of media ownership, online presence and computer literacy was on the radar of many artists, particularly women and in 1994, the LAB Gallery (www.thelab.org), a feminist gallery in the Mission, organized *Utopia v. Dystopia: Women in Multimedia* conference at the Yerba Buena Center for the Arts. Numerous well-known women media artists presented examples of their creative computer work, among them Christine Tamblyn, Lynn Hershman, and Rebecca Bolinger. (Notes of the author.) *Women in Multimedia* targeted feminist use of technology, perceptions of technological domination by men, and addressed the idea that computer art could mean more than secretarial work or household help. The industry would market them according to such gender bias: 'to store and manipulate records, accounts, budgets, recipes and reminders' (Kay 1977, 231) while 'businessmen should have an active briefcase that contains a working simulation of their company' (1977, 231). In 1995, the LAB offered email, film/video editing and Pro Tools sound workshops for women. Artists' Television Access (c. 1995), a cutting-edge media arts gallery for

low-income artists, and home of found footage artist Craig Baldwin, and early space for learning Internet skills, bought a domain name and dedicated one of four computers they owned to the Internet. ATA offered low cost classes and created a Cyberspace for Women Multimedia class for Latin women artists. The Digital Media Lab, directed by Joe and Nina Lambert, offered low cost workshops. New College of California, in the heart of the Mission, ran computer classes in Multimedia. (Notes of the author, 2004, 2005) This activity and generated discussion boosted online participation among aspiring media and computer artists in the rapidly growing, computer driven public sphere of mid-1990s, San Francisco. Just how many artists went online has not been published specifically, but, given that in 1998 the international Battle for Seattle, anti-globalization demonstration, was organized almost completely online, between countries and across borders, the pace of growth in online participation from 1990 to 1998 was quite steady. Sharing resources and skills among artists helped to popularize at least access if not ownership. Jesse Drew from Paper Tiger TV and Glenda Egan, one of the founders of the Interdisciplinary Studies Department at City College of San Francisco, created installations about the "information superhighway" in Artists Television Access' street window gallery. Overall, however, across the US, women, especially, did not start catching up in terms of ownership until the year 2000. (Ono and Zavodny 2002). Ethnic techno culture and new media arts culture in the Mission District persists today at CAMINOS Pathways Learning Center, an award-winning computer skills and repair service run largely by and for the Latin immigrant and working community. (www.caminossf.org)

Cost

Obstacles to home computing in the early years of wired-only access existed for many artists, largely because of cost. However prohibitive, cost drove the public to share equipment, utilize computers and access the Internet outside their homes. Public computing took place in shared and cooperative semi-public spaces, like university libraries, galleries, public schools, or cafés. Costs for carry able terminals in the 1960s to home computer kits in the seventies did not vary much. (Davis 1982, 853) However, in 1977, home computer kits 'began to be replaced by already

assembled computers due to the better microprocessors' and were still expensive as a hobby. (1982: 853). In 1993, an inexpensive LC50 Apple and home set up was s$3,500 US, for the CPU, monitor, and printer with attendant cables. As prices for personal computers dropped choices in type diversified. The iPhone now seems miraculous because it is a computer with eight gigs of memory, the size of a wallet, costing $400US. ($200 with a "family plan"). While the iPhone's OS does not work for file storage, owners luxuriate in a palette of networked communications, including Internet, web, mobile telephony, Face Time, texting, and an entertainment empire of applications.

SFNet

The mid 1990s saw an explosion of Internet cafés in the Bay Area, and in other bohemian, independent, virtual, and digital community, such as Australia's Byron Bay. (Personal communication with Gerard Goggin, 2006). The Well.com, a prestigious community of artists and thinkers grew as a social network of invited users since the 1980s. Low-budget public computing flourished when Internet cafes took off, however. Internet cafes provided ordinary people affordably access the Internet.

SFNet was a public computing network created at low cost to users. It was a café-to- café intranet set up as the café-goer's answer to personal computing. It consisted of twenty computers and cost one American quarter per minute. A personal email account cost $7.00US a month. It used an electronic bulletin board and enabled informal electronic information to flow electronically in urban space. A rudimentary DOS interface and homemade kiosks constructed from scrapped desks and cast-off pieces of laminated countertops linked the physical café visually with dial-up access and a 2400-baud modem. (San Francisco Internet Cafe 2005; notes of the author) On SFNet, one could email and use newsgroups or lists to communicate within the LAN, find a room, or locate a job. SFNet was free form, an analogue for oral communications (coffee chat) and free text (brochures/posters/newspapers), practices already familiar in the cafe scene. It was a distributed network, affordable and accessible, a nearly complete form of urban public computing. SFNet created public cyber place through reaching transient and local populations, email

accounts, local information, proximity, repetitive use, and visual metaphor. Jennifer Cino, describes SFNet thus:

> SF Net users, which include homeless people, punk rockers and the thankfully employed, either subscribe for $7 a month or put 25 cents into the cafe terminals every four minutes. The only time netters cannot socialize is between 4:30 a.m. to 5:30 a.m. when the system shuts down for maintenance, or when the mocha man shouts last call. The coffeehouse network idea was born in Wayne and Jill Gregori's Noe Valley kitchen four years ago. The entrepreneurial couple rejected the way society isolates people. Their solution was to design a virtual space where people could be accepted by what they share, rather than by their physical characteristics. The result was SF Net. (Cino, 1995)

SFNet was effective as an urban social network. It responded to issues of public access and cost effectiveness with respect to the growing popularity of the Internet. It addressed needs from job search to romance. Pay by the minute or hour workstations in cafes (c. 1998) also sufficed. Both this incredible SFNet and the later, still affordable but more costly and faster Internet café workstations, (then laptop pay per hour cards) closed gaps between transient, or flexibly motivated, lower income inhabitants and affordable access. Moreover, it created a social network and social space in the urban forest of the city.

Public computing through ‘pay for’ terminals in cafés and galleries now plays a nearly invisible role. Laptops have become affordable. Wireless laptops are common and café Wi-Fi is plentiful in cities all over the world. Wireless laptop use benefits cafés by reducing cost in maintenance of a workstation, and free Wi-Fi draws in customers. As of 2008-2010, Wi-Fi in San Francisco cafes is nearly ubiquitous, as is Wi-Fi in most Westernized cities.

Free and Recycled Computers

The final trope of discussion of public computing is the compelling arena of movement towards computer recycling and giving away old or discarded useable computer equipment to those who cannot afford to buy. In the state of California, where the industry is resplendent, disposable culture eminently popular, and environmental interest high, there is an abundance of programs.

Recent state environmental laws governing the disposal of electronic media such as cell phones, hard drives, printer cartridges and televisions connect with a burgeoning electronics recycling industry which donates computers and discards of them for their useful metals (gold) and parts. This industry has many less fantastic sides to it, such as export of recyclables to China where cheap labor is then paid little and exposed to chemicals in the industrial processes. (Johnson 2007; USAToday 2002) However, not all programs exist through these means and many perform vast amounts of charity work, getting computers to the Third World, supplying revolutionary activities, or supporting the public school system.

In a uniquely creative case of personal ingenuity, discarded computer parts found on the street, were repurposed by the late Dave McGuire, an ex Silicon valley programmer, to build fully-operational machines for the homeless, non-profits arts organizations, low income artists, and anyone else who wanted one. (Notes of the author 2008) An interview with experimental filmmaker Craig Baldwin, owner of one of McGuire's homemade computers, which gave him his first Internet connection as of 1998, Baldwin responds to the question of how Internet access affected his creative practice. He states Internet access enabled him to achieve a 'fluid, beneficial exchange' among curators for setting up a 1999-2000 tour of his film, *Specters of the Spectrum*. He also commented that he 'receives more ads, spam and unwanted information than he used to, but that a networked personal computer aided him substantially in his small art business of selling DVDs.' (Notes of the author) He said it was 'an absolute assumption of the art and film world today (2008) that an artist would have email connectivity and that it would be virtually impossible to function without it', stating it was 'essential for doing anything at all with film festivals, especially where photos as well as films are now expected to be submitted and projected in digital format'. On questions of personal boundaries and work, Baldwin stated that the Internet saves him from having to 'stop to answer the phone' and that 'if he had to do that as much as he is contacted' he would 'never get anything done.' However, he also acknowledged that he is sometimes a 'slave to the computer' because it takes so long to respond to email. It 'does help and it works for him' but 'it makes demands on his time as well.' He likened the experience of digital

culture to a 'tent that is pitched, that then expands and you have to keep moving the stakes to keep the tent covering what it is meant to cover'; that 'it is a culture that builds upon itself' particularly in terms of time. This was the primary drawback, since its not time spent making a film. Baldwin does not own or use a cell phone. (Interview with the artist, 2008)

Conclusions

With unequivocal benefits, personal computing is completely established as the basis of post-industrial urban life. Whether by fixity or mobile office, digital identity, online culture, personal style, flexible workplace, creative labor and globalization rely upon networked communication that began with the personal computer. In a recent study conducted with 300 students at San Francisco State, ninety-six percent had computers at home in addition to laptops or school-wide access. (Gordon in SFSU 2003). Meanwhile, screen-based surveillance paradigms suggested by Francois Truffaut's 1966 film, *Fahrenheit 451* have been somewhat inverted. The household is not only an extension of office space, but also a studio and web casting stage. Home users perform, report, and sell before webcams "live" to unseen, unknown audiences. Myriad networked performances have taken place in cyberspace and Cyber channels such as YouTube (www.youtube.com) attest to the vast sea of "talking heads" and commentators making amateur media culture. 'Girl Power' is a subculture holding considerable interest with feminists across the world. Girl Power is about girls' identification with careers in celebrity, fandom, pop music and super modeling. It is mediated and very powerful among pre adolescent young girls who own computers and are skilled with their tools. (Hopkins 2000, Lumby lecture, University of Queensland, 2004). Home computing has morphed into full-blown obsession with audience and participation among many digital cultures. To some extent, the medium aids a certain type of obsession, as Sherry Turkle pointed out long ago in many parts of her book, Life Online (1995) The television show 'iCarly' is all about young teen girl power and an online broadcast made by girlfriends. More recently, Girl Tech toys have celebrated wireless functionality in a line of purple and pink voice activated "diaries" and wannabe video cams which link directly to websites, also purple pink. (www.girltech.com) But, the highly personalized open ended "public" power of

online media has been expressed most blatantly in horrific 21st century uses: Tim McVeigh's execution and the decapitation of journalists by Al Qaeda exploited the ubiquitous audience of the Web as a political arena, while cybersex, exhibitionist web casts, and other vulgarity remind netizens about Web diversity and what length users will go to be "empowered". Ruth Davis wrote about the diverse computer audience in 1982, with in the first wave of the digital revolution:

> In the 10 to 14 years during which PCs have reached market maturity, their customer following and accepted uses have increased remarkably…originally, computer buffs were the buyers; now the customers are too diverse to permit categorization---they are almost all of us…the individual computer has changed the entertainment habits of America, it is making its owner's environment more secure, and it is aiding creativity and learning at the individual level. It is becoming possible for the entrepreneur to escape from the burden of financial management…and for individuals to bank and shop remotely despite the obstacles of sickness, age, and bad weather…' (Davis 1982, 853)

However, there has been an uneasy settling in: considerable consumer fear, cost considerations, lack of expertise, and other responses to personal computing. These fears, income and knowledge-related gaps have impeded the acceptance and installation of personal computing among specific groups: older people, women, and lower income groups. These relationships to technology have been vastly historically different than that of well educated white men, the earliest leading group to utilize computers. Dystopia themes of surveillance in popular films have exposed the negative side of networks, screens, and pervasive technologies. Truffaut's *Fahrenheit 451* or the remake of *1984* explore fears of authoritarian use of networked technology in surveillance of private households and domestic space. *Fahrenheit 451* is about government control of populations through domestic screen technologies.

But, having been consumed, thus, domesticated (Silverstone and Haddon 1996 in Wilken 2005, 6) home computing is entrenched in Western cultures and computer and gadget ownership is now equal if not greater among women. The spatial parameters, however, of this residential computing are changing with innovations in screen size and resolution, laptop cost and power, mobile

networks and devices, Bluetooth peripherals and so forth. Personalization persists, not only as an idea, melding new gadgets with old and producing new disruptions and social conditions, but new relations of connectivity, interaction and storage. In short, 'household boundaries are extended […] by the increasing mobilization and personalization of communication and information technologies…' (2005, 8) Network mobility 'further extends household boundaries by "dislocating the idea of home, enabling users, in the words of the Orange advertising campaign…'to take their networks with [them]' (Morley 2003, 451 in Wilken, 2005, 8) 'Networked mobility reinforces the idea of home.' (Wilken 2005, 8)

CHAPTER 6

Mobile media in recent activism

Introduction: Comments on Globalization

In thirty odd years time, a massive restructuring of western societies and their impact and influence upon nonwestern societies has taken shape as a result of networked technologies, personal media empowerment, and the presence of mobile communications technologies. This reshaping is one effect of globalization and refers to complex overlaps present between the powerful cultures of wealth and their relations with poorer cultures. Overlaps manifests in art, architecture, banking, commerce, education, economics, international boundaries, medical practices, migration, travel, transport and war. In processes of globalization, home computing, inexpensive tools, network access, and now wireless mobile media have played seminal roles. (See Chapters 3-4) Personalization of media has brought about higher degrees of knowledge, ownership and use of media tools across cultures and subcultures. The much enjoyed, praised, speculated 'media empowerment' from personalization has contributed to changes in work and political life in fields outside of its mainstream marketing. This Chapter examines a period of activism from approximately 1991 to 2004, across two continents, West Coast of North America and East Coast of Australia, in which scholars recognized new technologies for playing powerful roles in the production of social movements. The Chapter addresses in particular, the advantages of mobile communications for protest culture in the context of the Internet, previous technologies for organizing and strategizing and discusses social action and participatory media.

Indy media and the Anti-globalization Movement

Between 1991 and 2004, independent media activists and journalists, from culture jammers to video activists, worked with environmental groups, public health networks, and third world economies to protest mounting globalization of the Third World, and the role of large western

economies in its development. A global social movement, which came to be called the "anti-globalization" movement, grew and spread virally as a complex, internationalized left-wing political base between communities, countries, groups, and individuals. The most powerful, far reaching, networked communications tools, the Internet and World Wide Web, as of 1993, were used to organize this movement. Indymedia Centers were one result made possible by the Internet and World Wide Web. Indymedia was an outlet for information, organization, and participation. Indymedia's primary function was to create space for self-mobilization and self-representation for alternative representation of issues and among protestors. This is a kind of space desperately needed to counteract centrally controlled broadcast media where public access voice is virtually non existent. Indymedia Centers (physical spaces) and websites worked with notions of democratic participation (sharing resources, tools, meeting space) and the simple, technology-enabled unofficial reporting and recording of events by ordinary people. Lay person journalists could post, upload, repurpose, and critique others' uploaded content.

Indymedia's global network started in Seattle in 1998, prior to the now-famous "Battle for Seattle" demonstration in which protestors stopped a meeting of the World Trade Organization. Indymedia Seattle operated as a base of operations for international journalists, videographers, web artists, and anyone with a story or a camera. The Indymedia Seattle website was the first in the network and its open publishing software, Active, was an original collaboration between Sydney-based Catalyst programmers, Matthew Arnison, a lead programmer, and programmers/activists located in Seattle. (Notes of the author.) As a result of the extensive need, reliability, and success of the Seattle Indymedia center's Active software and website, Indymedia centers cropped up in cities all over the world to become reliable temporary bases for independent journalists and activists, real and virtual, during subsequent anti-globalization protests, local actions and other events.

Indymedia, with its focus upon place-based protest, sharing of global protest situations, and fostering of discussion and participation, was an enormous achievement in networked alternative media. It effectively met one of the single most important goals of independent and alternative

media activism, that is: how new technologies can be used to get the story out, let cultures and communities speak, and develop authentic, effective grassroots communication between activists all over the world. Transparency of the open publishing platform of Indymedia websites has been of sincere and extensive interest to communications and media scholars. In the context of the Indymedia network and open publishing, political communication was developed that radically transformed ideas of global networks, indeed, the global commons (Kidd in McCaughey et al, 2003), and issues of imagined communities versus those place-based, "on the ground" or intensified through activism.

Rituals of Protest: Questions of Participation

Books such as *Cyberactivism: Online Activism in Theory and Practice (*McCaughey, 2003)**,** *Future Active* (Miekle 2004) *Fences and Windows: Dispatches from the Frontlines of the Globalization Debate* (2002) or *Dark Fibre: Tracking Critical Internet Culture* (2003) have chronicled use of electronic political and social networks and the impact of new media on activist culture. Hacktivism, online polling, list culture and Indymedia were new concepts for the late twentieth century culture of protest. These types of democratic participation in the global, public sphere posited significant alternatives to the unconditional and familiar ritual of, for example, street protest for which most protest culture is known. Eminent global media scholar, Geert Lovink has suggested that street protest may have limitations and called for greater imagination. (Lovink in Meikle 2003, 12) An essay by Graham Meikle on political activism surrounding "We are all boat people", which emerged after the 'children overboard' story in Australia of the early years of the 21st century, looks at the use of new media in the protests. The perspective is offered that boredom and reification arise in protest culture, often to stultify activist work. Arguably, this tendency eventually plagued the anti-globalization movement, for example, after relentless attempts 'to have another Seattle' were made (as was stated by an anonymous protester in Melbourne 2003). In response to the boat people incidents in Australia, and probably as a result, in part, of the influence of Sydney scholars, intellectuals and tactical media pundits, but, also, arguably as a cultural difference between American-based and Australian-based protest intensity

and alternative media networks, Australian activists produced out of the ordinary forms of activism. TILT (Trading Independent Lateral Tactics) gave rise to *We are all boat people* (http://www.boat-people.org/), a protest project utilizing projections onto the side of the Sydney Opera House, poetic actions such as candlelight vigils, floating origami birds, and other non-violent protest events were made. An active, informational website, news/photo archive, and email releases geared at reaching the mainstream, widely circulated newspapers and art magazines were also created. (Goggin 2004, 84) The *BORDERPANIC* conference in Sydney in 2002 was widely publicized and included leading international tactical media practitioners, and represented artists engaged in counter media spin and tactical actions. (Goggin 2004, 84; Finegan 2002; Wark 2002) Active-Sydney was a site set up for local action. Public artist Deb Kelley produced her 'Boat People Welcome Here' email posters, printable on a household computer printer, for Australian residents to post in their windows (exploiting presence of personal computers in daily life as a distribution network.)

Mobile Tactical Practices

Lovink argues that the 'classic rituals of resistance are no longer reaching large portions of the population' (2002, 12) and that tactical media needs to respond by rethinking its methods in order to be, once again, tactical. Lovink posits 'tactical escape route[s] from this imaginative dead-end' citing The Biotic Baking Brigade as an example of tactical media in which a 'highly mediated practice--of throwing pies at IT professionals and famous politicians---exists only as mediated event' (2002, 12). The Biotic Baking Brigade's interest in the well-known and famous assured that the pie throwing was televised or web cast. Their action would then shake up public opinion and draw attention to issues. (Liiv 2002) Their tactic, in Lovink's terms, constituted a 'tactical escape route' from less effective activism. When televised or webcast, it evolved into a 'mediated' event and reached a wider audience. Biotic Baking Brigade actions thus, exploited broadcast communications interest in noteworthy individuals and in so doing, 'reversed the one-way-flow of communication and power.'(Meikle 2002, 13) Positioning tactical actions to reach the public in a radical context is a Situationist detournment or reuse of the original media to have

new meaning in another context--a culture jam or a tactical effort.

The "Oscar Grant Footage"

In recent instances, the public presence of cell phones has proved "activist" in relation to public events and created controversial documentation of community events. In an incident reminiscent of the notorious video footage of Rodney King being beaten by four white policemen (1992), several minutes of cell phone video taken of the shooting death of twenty-year old African American Oscar Grant while lying face down on a Bay Area Rapid Transit (BART) platform, with hands behind him, surrounded by four police officers early New Year's Day, 2009, rocked the State of California when made public. The footage was sent to the Web within minutes of the shooting and has been instrumental in raising awareness and publicity for the ongoing pursuit of justice by Grant's family and the black community in Oakland. (Bay Area Indymedia 2009)

Both events, "Rodney King" and "Oscar Grant" involved eyewitness these homemade eyewitness videos. The prosecution used the notorious "Oscar Grant footage" from several different passengers during trial, sparking debates about the use of video in courtrooms.

Benefits to Activists

Mobile communications benefit tactical media through networkability, smallness, and speed, as well as ubiquity and portability. They are often an available resource for recording or message making where no other tools are available. Activists can strategize more efficiently and outwit police through micro coordination of efforts (Hjorth 2007, 1-3; Ling and Haddon 2007) or Mitchell's concept of 'walking architecture'. (2003, 81-2) Precisely because they are about the body and the street and are ubiquitous, mobile communications potentially invite greater civic engagement and participation than other media forms. Texting a certain number engages donating to political causes, in a limited form of participation. Mobile tools are immediately tactical as well, to establish sense of place in social networks during protest. (Note: txt.mobbing is discussed in Section 5) Mobile tools extend electronic networks and offer additional "channels" by which to reach others, audience, or the Web. Localized social space of activism thus is enabled to become more immediately communicative and possibly more inclusive, in terms of citizen participation

and action. The exchange of visual and audio information is made faster, more possible, and potentially more powerful due to multiple channels which can be reached, for example, the Twitter, Face book, RSS, and so forth combination now appearing on most social media and networked media. Protest culture, to be successful, relies on concentrated, localized communications within demonstrations, actions, and locations. It is enhanced by the micro mobility of the mobile tool and network, as well as by its micro communications potentials in texting and MMS. Goggin writes, 'cell phones should be regarded as having culture---that activist wireless media has important precedents and parallels, being a medium unto itself.' (Goggin 2006; 2007). Mobile media emerges, then, not as a slew of fetish items and activist fashion trends, as 'white guys with PDAs' (email from Coco Fusco c. 2004), but as tools and networks that enable greater synthesis and coordination of actions. This view of history, as wireless, establishes itself on a widespread basis and begins to suggest the life cycles found in social practice.

> Moments of creation, resistance, and expression are constituent elements in an on-going process of creating new forms of sociality and community, new forms of life. (Shukaitis, Lerner, Hyde, 2005)

Activism sometimes requires preventing detection of recording equipment by the police. Small tools make this infinitely more possible. The Biotic Baking Brigade had to build fake briefcases around their camcorders to get footage of response to pies. Mobile videos in hand held devices preclude this sort of ruse. Nevertheless, more importantly, networked mobile communications make sending dissemination of pictures, video, and text possible across the spectrum of any networked protest or action to other portable devices. That said, for media activism, the benefits of mobile communications lie in their 'anywhere' connectivity, effective speed and lightweight battery life versus what would instead be walkie-talkies (cumbersome) or word-of-mouth (slow over distance) or landline telephone (public phones not always available in the street) or having to upload to a fixed computer "terminal". To this end, mobile networks reduce lag and human error in the immediate culture of protest actions. Reliable networks enable swift, effective communication between organizers over distance and allow messages to penetrate into and

through demonstrations via ubiquitous devices.

Ubiquity and Public Space

Urban public space has been designed throughout history for social use: plazas, parks, sidewalks, and streets have been made to foster public mobility and gathering, though some would argue quite rightly that public space has never existed. Frank Apunkt Schneider and Gunther Friesinger state:

> As public, 'space' has always already been subject to relations of domination. This even holds true for the 'agora' and its ancient slave-owner-societies. (2010, 31)

The town green—is governed---yet, tacitly and symbolically, dissent is allowed. Dissent poses alternatives to prevailing events in governance and the politics of everyday life. At the same time, urban public space was invented as to function within the structures of urban private space. In contemporary cities, it offsets urban residential and commercial density, supplying the invention of the working classes with spaces of leisure, respite, and a modicum of "say" or "control." Until a decade ago, urban public space was nearly devoid of electronic messaging. Now it is augmented and frequently audibly affected by nearly ubiquitous cellular, wireless and Wi-Fi networks; ring tones and phone conversations. This ubiquitous presence of communications technologies in public space creates conditions for activism and the protest culture which have never existed before.

Firstly, ubiquity infiltrates spaces not activated previously by communications media and it does so with compelling, rapid connectivity and reach. Information can be made mobile, passed quickly from virtually anywhere, in any language, to other operating mobile devices. Increasingly applications for specific mobile-web combinations of so-called "social media" make this more possible. Multitudes of communicators are capable of participating in the immediate realm of new communication technologies, a useful aspect of the tools for organizing practices and direct action. Secondly, ubiquity forms a 'field of presence' (Mitchell 2003) useful for bulk transmission of updates and information. Sadie Plant first articulated the field of presence of ubiquitous mobiles as a 'sound scape' (Plant 2001, 29). The notorious ring tone revolutions that helped

depose Estrada and Arroyo in the Philippines, and efforts to "txt.mob" at the Republican National Convention protests in 2004, New York (McHale 2005, Rheingold 2004; Berrigan 2004; IAA 2004) exemplify the use of this sounds cape for activism. (Note: These examples are detailed later in this Chapter) It is thus argued that the potential of wireless media, as a broadcast surface, when large concentrations of people are gathered is enormous. Urban public space, laced with mobile communications devices, and including laptops can effectively utilize dozens of speakers and transmitters in its flow. Moreover, the wireless medium directly relates to the street, already an information conduit with an activist history in the passing on of information. Kiosks, telephone poles, sidewalks, and walls have historically acted as communicative surfaces for public billets, placards, stencils, and signs. Some of this activity has necessarily been virtualized and gone "on screen" to the Web, but cities still communicate through streets. Protest takes place in the street and at urban centers, alongside hacktivism and internet mobilization. Mobile media engage protest culture by reinforcing already inscribed activities with greater connectivity and the agility and ubiquity of small-scale electronics. They possibly open greater democratic participation on the part of future users especially as devices and networks become increasingly interwoven and context-aware.

Inexpensive Recording: Video as Mobility and Cell Phone "Pictures"

Social movements have been historically dependent upon "homemade" media: banners, buttons, face-to-face meetings, pamphlets, placards, ribbons, signifying colors, signs, telephones, theatre, and word-of-mouth have been essential elements of political organizing, as have, more recently, printed matter, book publishing, written correspondence, the telephone, video and broadcast radio and alternative television. Using commercial video Portapaks and camcorders, feminist activists, for instance, capable of inexpensive reproduction of their ideas, expanded their influence exponentially. Working with the 'national Women Against Violence Against Women (WAVAW) in 1977, Leslie Labowitz crafted a large scale media event, *Record Company Executives Drag Their Feet* involving a mock press conference and faux billboards to educate the public about the crime of rape, still misunderstood and ignored in American culture'. (Lovelace, 2007, 15; Roth

1990) Labowitz and WAVAW used video to document, then exhibit the work. When Suzanne Lacy and Labowitz formed *Ariadne: A Social Art Network,* maps and other media forms, including video, were used to produce multiple, networked awareness campaigns about rapes occurring in East Los Angeles, including the infamous "Hillside strangler". (2007, 15; Roth 1990) These early storytelling projects, shared among women, utilized the new medium of video which allowed feminists to network easily and inexpensively around shared images and documentation. Contemporary corollaries are recordings of execution of Afghani women by the Taliban made by undercover Revolutionary Association of the Women of Afghanistan (RAWA) videographers. These videos made on portable video cameras have helped raise international awareness of conditions of women and girls under the Taliban regime. (AP 2002, http://www.rawa.org/murder-w.htmwork)Video technology has thus been essential to activists as an immediate, inexpensive, easily reproduced and distributed medium. The portable video medium is thus an early mobile technology. Its industry history has many similarities to the influx of mobile devices today, all smaller, cheaper, and more portable and carry able than before. Video is a link in the chain of innovations in the networked media we know and use; the Internet, multimedia and wireless media are all inherently more democratic tools than those spreading news in previous eras.

Alternative Television and Web casting

That video was integrally connected technologically, as well, to the electronic apparatus of television, made alternative developments in experimental television, such as the work of Deep Dish TV network, and Paper Tiger Television, New York and West Coast, possible. Video has made the potential "democracy" of television's ineluctable ubiquity, thus its empowerment to news making, consciousness raising and storytelling, possible. Activists have utilized video for citizens' journalism across many countries. The Internet has only made activist information easier to share and distribute. During the Battle for Seattle blockade and demonstrations at the World Trade Organization in Seattle, 1998, as a result of alternative satellite network, such as Deep Dish and Free Speech TV, first ever daily independent broadcasts of protests were made possible across the United States. These broadcasts were an historic achievement in alternative television

because they demonstrated, themselves, the established, even, large-scale news apparatus that independent, alternative media had become. Fast digital editing and easy uploading to the web through Seattle's Indymedia Center's open publishing website was also exploited by activists for its extensive media power making response to, and support for, the Seattle actions possible throughout the world. Finally, in this litany of ever-shrinking and more powerful tools, digital cameras and those increasingly embedded in mobile devices, even now as high definition cameras, bridge a critical space of mobility, between video and the Internet, or video and the small, portable networked device. Such power lies in the fact that once shot, the video can instantaneously, on a good network, be sent to the web, or sent to another device. Conceptually, this speaks to the politics behind Indymedia websites open uploading, since getting to the web means global audience. The more quickly it can happen, without the past requirement of a fixed computer, the better the communication. IPhones and other similarly enabled devices are now utilized in "citizen journalism". In the beginning of the war on Iraq, the Pentagon's used "embedded journalism" and video casts made directly to news stations via portable technologies such as DVIDS. (Lindner 2008; Miracle 2003; Smith 2003) Mobile technologies and their interrelationships with the Web, in the form of social media, continue to expand activist culture by increasing web-based global reach empowerment to ordinary people and through the ubiquitous "blanket coverage" of working mobile devices.

Wireless Street Art

In 2004, *Spectropolis* festival organizers described wireless media on the website as:

> a way to connect spaces not normally considered part of media production, as a way to increase the capacity of media communication, and as a way to investigate or link audiences to public discourse and involve the public's participation and response'. (Spectropolis 2004)

Spectropolis 2004 focused its efforts on activating non-networked spaces, ad hoc and interactive media spaces by drawing on street scale flows with wireless electronic means, (Spectropolis

2004; http://www.spectropolis.info/) Wireless was seen to enhance social communications processes by making them more accessible and transparent. A group of rain umbrellas, for instance, became the location for amplified conversations underneath them that could then be heard elsewhere. This wireless art is effective in that it separates location from receptive audience location(s) and demonstrates the capacity to distribute audio-visual material across a dispersed audience in the sound scape. *Spectropolis 2004 exploited* the spectrum of community: the street as conduit for information flows. (Ibid 2004) Small-scale social networks in the city street augmented and enhanced with wireless made the presence of flows of everyday life more visible and audible. Wearable art, ad hoc networks, the rain umbrella audio bubble, the bicycle message making wireless antennae, and weather balloons used for projecting onto sidewalks, were wireless projects that created social embodied connectivity and networks at *Spectropolis* (2004) In other itinerant, wireless urban space art, The Bureau of Inverse Technology deliberately problematized location and networks in their New York City BIT::CAB experiment. A webcam mounted on the top of a moving taxi cab sent random images of the city from the cab back to the web. (BIT: CAB, BIT 2002, http://www.bureauit.org/cab/) In this "mobile event" art, images captured randomly talk about the degree to which what is sold to the public as wireless media is a constructed spatial idea about how that media is to work, and what it is good for. BIT::CAB is also a play upon an earlier Bureau project, BITPlane (1996) in which BIT mounted a tiny, wireless camera on a remote controlled airplane and flew it in restricted airspace above Silicon Valley, receiving live video feeds.

In literature on mobile social revolution, location-based technologies and smart mobbing practices have received the most attention. Arguably, location-based technologies, as they become increasingly context-aware and carry GPS, are highly useful, while, smart mobbing, it would appear was a somewhat temporary and gimmicky phenomenon. However, wireless media provides activists with the capacity to transcend boundaries and connect from anywhere. This saves cost and time, both valuable to activist culture. The tools can be concealed from authorities

in most cases making certain kinds of actions, such as spontaneous pie throwing, or recording in unauthorized locations more possible. Communication thus, takes place where little or no access by unofficial, independent media is allowed. (Notes of the author 2004)

S.5 -Advantages to Mobile Phone Use in Activism	
1.	**Activation of spaces** having no communications, with high-speed cellular, mobile communications and/or recording
2.	**Ease of set up** of wireless networks, where there are none, in disasters/emergencies to replace other networks
3.	**Having ability to broadcast** text messages, at the very least, to multiple devices, and in some cases or circumstances: images, audio, video files (pod casts) and other multimedia.
4.	**Ability to transport data** in small, lightweight, portable formats on laptops, peripherals, USB sticks or "thumb drives" which are all relatively inexpensive, and lightweight
5.	**Micro mobility:** to maneuver with a small portable communications and networks while riding bikes, running, or walking.
6.	**Concealment of networkable devices** to participate in unauthorized areas.

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Civic Engagement: Flows and the Social Space of Crowds

In most western democracies, civil protest is a right under law. It affirms the social contract of political communications from free speech and "vox populi" as forms of democratic participation. While international scholarship confers that wireless media creates new techno-social and cultural conditions (Richardson 2006; Castells et al, 2007; Goggin and Hjorth, 2007) certain unique characteristics can be observed for activism. Communications theory on participation provides useful clues about action, reception and transmission. Firstly, the speed and efficiency of wireless media, which reduces the primacy of location-based communication, as mentioned above, enables participation for sender-to-receiver and receiver-to-sender. This experience and capability of

mobile media, whether text, voice or multimedia file, clearly alters relationships according to co-present belonging. Mobile phone users are uniquely capable, of 'co-present place making' and 'urban metabolism' (Hjorth 2005, 1-7; Townsend, 2001) and, to this end, gain empowerment through use of the new tools for reiterating and confirming participation in community. Christopher Shumway, writing on participation, offers this explicit framework with respect to empowerment and Internet media:

> Ideally each newly empowered audience member would become a regular content producer and a more politically involved citizen who would, in turn, reach out to others and empower them, and so on. (Shumway 2001)

Here participation is understood as being about 'reflexive terms' (Atton 2002) or, an emphasis on 'media operation – creation, production, distribution – as well as on the process of the communication practice itself' is made (Vatikiotis and Kavada, 2004; 18). Shumway talks about the audience becoming producer with the hope lying in that activity producing greater political involvement. The power to contribute and become more involved, Atton suggests, takes place partially in 'the deliberate decentralization and relinquishment of control of the processes of reproduction and distribution…' (Atton 2002, 42)

> In the case of alternative communications/media practices, the empowerment of those who participate in them happens…in tandem with reflexive practices that take place in the production process, establishing their own alternative frames of participation, power and creative action. Participants do not simply consumer reflexively, but produce reflexively in an attempt to 'change the way they construct themselves, their actions and their life-worlds. (2002, 155)

Atton is primarily concerned with alternative printed press and zine-making, but there are plausible corollaries to frequent use of electronic media in the distribution of e-newsletters, for example, and to mobile media when small-scale communications work are compared. Vatikiotis and Kavadas' overt concern for 'the meaning and value of alternative media…[and] on political practice as a key aspect for the enactment of citizenship' positions 'media as the locus for the

production of political identities' a notion close to concepts of selfhood as and 'democratic participation' (McQuail in Vatikiotis and Kavada 2004, 1, 6) They write, '…in the democratic participation theory, media are ideally constituted in small-scale terms, favoring horizontal patterns of interaction and facilitating the expression of citizens needs.' (2004, 6) Mobile media fits perfectly into this communication and participation model. As a micro broadcasting technology it has both one-to-one and one-to-many forms, and many-to-many distribution, similar to the Internet. This multiplicity establishes flows of non-passive participation and reception in an alternative public sphere whereby micro communications 'provide the material that sustains the sphere's function as a place for the formulation, discussion and debate of radical and dissenting ideas.' (Atton 2004, 50) Likewise, alternative media theorist John Downing has addressed the 'polemical aspect of small-scale media projects…through the evaluation of media projects as resistant practices in terms of radical media.' (Cited in Vatikiotis and Kavada 2004; 1984; 2001). Downing sees radical media as 'offering a space for alternative discourses in public debate' (2004, 10) This would include urban hacking, culture jamming, and other interventions, as well as independent journalism. From these theories the potentials of mobile media to distribute, disperse and empower small-scale processes can be seen. They also explain how technologies created for individualized and private one-on-one conversation can be an effective social alternative when used to shape communication in cultures of resistance.

Communication and Information in Social Movement Cultures

Solidarity-formation through information and social networking is essential to the sustainability of social movements and successful activism. This suite of practices support the much needed convergence of events, ideas and people, and is enhanced by wireless, mobile media in several important ways. First of all, through smoother, faster micro mobility, wireless, mobile media support activist strategies in direct actions, or in general, through more efficient, far reaching and speedier communications practices among participants, thus increasing fluid and seamless "social movement." Downing's thought on participator media involves acknowledging 'ephemeral media forms' (Vatikiotis 2004, 11) and a concept of 'self-mobilization':

> Constructive social change must be built based on mass activity, of self-mobilization. Effective communication within and by social movements is, therefore, a vital necessity for self-mobilization to emerge and prosper. (Downing 2001; 31)

Self-mobilization within radical social movements and their media bears some resemblance to observable formations of identity and difference created by users of personalized communications, and the micro-reliance, in that context, upon co-presence, customization, and intimacy (Hjorth 2005, 2007). All of these affirm the users' sense of belonging in the attending community. Self-mobilization is a self actualization. It is identity formation gained through social value attributed to and renewed in, acts of specific participation. Wireless mobile media aids participation in protest culture through speeding up and making flows flexible and portable. Users can engage more directly with hyper local events and have opportunity to contribute to online media from their handheld instruments. This would contribute to agency and empowerment of the demonstrator. More effective political communication—supported by multiple "channels" and portable flows—assists in strengthening the experience of events. It definitely leaves critically important, residual documentation online: Face book pagers, Twitter threads, websites, images, blogs and videos – all present, after the fact, and the more participants, the more open and fluid is the appearance of the event. Technological empowerment in social movements is especially profound when better means are achieved for both participation and distribution. Communication needs to be widespread. It needs to be participated in, thus to involve large audiences, as Shumway would recommend. Sustained reception of ideas across these spaces tends to hold or unify movements as witnessed in the recent Obama campaign for President, when the sheer quantity of polite, message-oriented emails was a constant reminder and reiteration of his historic bid. Secondly, the ubiquity of wireless mobile media increases the potential social power of political communication. Flows and social networking of ideas, information, photos, and updates increase with mobile use and, arguably, create engagement and participation. Voting by cell phone, for instance, engages voters excluded from other networked access. Obama's success in utilizing cellular phones for increasing voter engagement has been acknowledged. (Delaney 2008; Carr 2008; MCDM 2008) In utilizing this communications "channel", he reached groups least

likely to vote in American elections, such as African Americans. According to Pew Institute statistics, African Americans have a 71 percent rate of cell phone ownership. (Ross 2008)

Wireless Activism: Four Case Studies

The following case studies illustrate the successful deployment of communications and improvement of communications flow via mobile media in the context of protest and radical activism. Improved communications flow can be summarized for the following three conditions:

a) Between participants in a direct action

b) Between participants of large groups

c) Between otherwise non-networked groups.

The purpose of these studies has been to examine of 'flow' demonstrated in the use of mobile networks; how mobile devices and networks have been used to augment older devices and non-technological tools and to show how mobile communications have shifted time and space (or increased their metabolism?) to close distance between transmissions and feedback loops. Data and resources can be relocated while activist strategies are in process, 'permit[ting] the withholding of commitment to a set course of action until the last possible moment, always holding open the window for better information.' (Townsend 2000: 12)

Circumventing Police Tactics

While the Biotic Baking Brigade (c. 1998) had to conceal video camcorders under folded newspapers or coats in order to record their pie throwing activism, today's mobile cameras-of-the-people, or camera phones, are easily concealed and difficult to detect. (Whispered Media 1999) Micro mobility is an explicit benefit of wireless; a combination of their portability, reach, and speed which enables users to organize quickly over small, local terrains. Some examples of mobility in activism demonstrate that micro mobility has made actions successful. For example, activists now have better means to gain unauthorized access to events and can prevent vital

images/data from being confiscation by authorities more easily. Small tools and mobile networks can be concealed and enable the rapid transference of data to remote locations. The effects on activism of electronic mobile media are exemplified in these incidences.

a) Prior to CHOGM 2001, Australian police announced that among prohibited items would be: 'A communications device – other than a mobile phone – capable of being used to organize activity disruptive to CHOGM' (Police Powers and Responsibilities Act 2001, Queensland). While they allowed mobile phones, they were eliminating most video camcorders. This restriction was somewhat meaningless given the sophisticated second-generation video and photo equipped models of cell phones then available. This is also an example of telephony, not multi-functionality, being the dominant mode of communications attributed to the medium.

b) Micro mobility is an affordance which works to circumvent obstacles and limitations of locations. At the Woomera Freedom Festival 2002 and Baxter Easter 2003 events in the Australian desert locations around the incarceration of refugees, wireless media played an essential role in direct action. Both sites, Woomera and Baxter, presented media activists with specific significant challenges: lack of network access at Woomera and an excess of police presence and heightened security at Baxter, major obstacles to in-person communication with the incarcerated. Where network access did not exist, laptop use occurred to record texts for uploading later. In the case of Woomera they were transported some fifty km away for this purpose. Where tough security measures were in place but some network access (Baxter) was possible, devices were smuggled in so that voice communications from inmates could be transmitted over Internet radio. In both locations, the flexibility of wireless media, its capacity to combine with the Web for broadcast, to be highly portable and concealed, enabled activists to respond and still attain their goal of making independent media about human contact with the refugees.

c) During the Republican National Convention in New York City, 2004, Mike Burke, of Democracy Now! received a phone call from arrested protestors inside an abandoned city armory used as a police "holding pen." A group of activists, all women, had smuggled a cell phone past

police and reported to Burke on inhumane treatment and their illegal arrest. Later broadcast under the title, 'Guantanamo on the Hudson', wider audiences heard the content via radio and the Internet bringing drawing attention to the treatment protestors by New York's City Police Department.

d) The synchronized activities of radical bicycle group Critical Mass involved micro mobile media for their success. Critical Mass organized synchronous disruption of traffic at forty intersections in San Francisco as a direct action to oppose the invasion of Iraq in 2003 by US and allied forces. Activists, wearing ski masks and using cell phones to organize and execute the timed plan, managed to mess up commuter flow and outwit riot police. The feature documentary *We interrupt this Empire* was made about this action and the many other anti-war protests taking place across the city and nation at that time. (San Francisco Video Activist Network, 2003) These incidents and events show how mobile networks eliminate barriers to locations and engage issues of censorship and free speech.

SMS Bulk messaging Systems

SMS bulk messaging systems such as Frontline SMS, and 'homegrown SMS Gateway' or 'TXT.mob', a program conceived for batch txt.messaging to those subscribed to the network (IAA 2004), offer critical new opportunities for activist communication. Frequently used by NGOs working on various causes, especially where Internet access is missing or poor, SMS bulk messaging is a quick and efficient means to reach a large and dispersed audience. This excerpt is from conversations with 'Banks' the creator of Frontline SMS:

> ...many NFP's and NGO's ...have become interested in text messaging and the mobile medium because of its ability to provide the most poor and usually unconnected people in the world with cheap real-time information and communication. Most organizations that have worked with, built or implemented a non-web mobile solution have, for the most part, been doing it for themselves...' (Verclas 2005)

In addition, the article continues:

> Banks developed Frontline SMS, an affordable stand-alone turnkey, 'out of the box', solution that allows smaller organizations the ability to access 'group' SMS technology at any location a mobile network signal can be reached. No connection to the Internet is necessary. (Oberman in Verclas 2005)

Two particulars stand out. One is, affordable systems are set up by activists to serve small organizations and the other is that mobile network signal makes up for Internet in unwired places or regions. The first speaks to wireless media use and available socio technological improvements. The latter describes the symbiotic relationships of many electronic networks; namely, that they overlap and fill in for needed coverage in areas where other networks drop out or do not exist. This is of great value when considering difficult or impossible locations for actions (such as Woomera and Baxter) and for purposes of visualizing on going network convergence.

TXT.mob

This application for the cell phone differs slightly from the txt.message systems discussed above. Firstly, it was created by activist/artists as an autonomous social networking SMS channel, used at the Democratic and Republican National Conventions in the US, 2004, and other instances, but exclusively during protests. (IAA 2004). Secondly, TXT.mob offers subscribers more than one texting group and various data channels from which to choose. How it works is described below:

> TXT.mob is free service that let's you quickly and easily broadcast txt.message to friends, comrades, and total strangers. The format is similar to an email b-board system. You can sign up to send and receive up-to-the-minute messages from groups of people organized around a range of different topics. (IAA 2004)

Subscribers easily become informed audiences of participants. In this post to the [faces] listserv, the writer describes her experience. She writes:

> The RNC Ruckus Society set up a techie-media tactic that proved very useful. They had a number you could call on your cell phone to subscribe to a text message network. I

> received updates all day about what was happening with the march, where the arrests were happening, any alerts, etc. So, when we had been waiting, smashed together, at 13th St. for an hour and were wondering why we weren't moving, I got word from the messages that the front of the march had just turned the corner of 34th Street. Many others had radios set up to receive broadcast information just about the march, and would then announce those messages to the crowd. Perhaps this is one reason why the march seemed so organized; connected participants diffused information rapidly. (Berrigan 2004)

While others have found TXT.mob 'sluggish' (personal interview with Whispered Media, April 2004, San Francisco), the medium's feedback loop, in which updates on the march lent immediate perspective, optimizes two planes of experience for the user. One is electronic and psychological co-presence (Hjorth 2005), or unity gained from data and connectivity, and the second is physical and practical, at the level of an efficient means of reception. TXT.mob is also described as 'allowing Indymedia and legal observers to 'watch' the demonstration in a more coordinated manner and ... videographers [to] set camera locations ...' (IAA 2002)

In terms of philosophies of use, TXT.mob's subscription/delivery system addresses the conundrum of social space vs. market individualism and the legend of ubiquity. It works, even when *few phones* are present, if a climate of *tool sharing* and *open data exchange* is in place, by old fashioned word-of-mouth. How it works is not an argument for ubiquitous ownership, but rather recognition of the presence of mobile media access within the mass (and networked) audience.

Ring tone Uprisings and Ubiquitous Mobile/Social Space

Remarkable displays of coordinated, mass movements enabled by wireless media have been recorded in the Philippines, where the ring tone uprising against President Estrada, now very old news, was conceivably a model for the more recent downfall of President Gloria Macapaga-Arroyo in June 2005. Research suggests that the strong culture of orality 'found in the Philippines influences widespread use and acceptance of mobile telephony. In the Arroyo incident, a

recording of her voice, reproduced as a ring tone, implicated her in election fraud. Each phone operated as a tiny speaker in a random and dispersed broadcast, insinuating itself into 'sonic space'. (Plant, 2002: 62) Such an effect suggests how wireless media can make considerable political impact. Ring tone protest emerged in a US based project 'Riot tone: Ring tones for the Revolution' in which proprietary American ring tone industries were challenged. Created by programmer activist Evan Henshaw Plath, Riot tone utilizes an open source system to generate original ring tones and shares them via the Web, thus challenging controls on copying and making 'spreading messages among politically aware young people' all the more possible. (Trendcentral 2004) The title of the Trendcentral article, 'A new form of bumper sticker?' connects ring tones to traditional paper message systems, as well as referring to the Philippines. The article states:

> Adding to the plethora of bumper stickers, buttons and t-shirts, political activists now have another means of protest; the ring tone. First heard in the Philippines protest ring tones have recently popped up, albeit in small numbers around the US as well. While those heard thus far have been predominantly anti-Bush, we expect that conservatives will also ultimately adopt the trend... (Trendcentral 2004)

In the article 'Ring tones: The New Protest Song' not only does the music industry see potential in the protest market, but activists hail Plath's software:

> …political ring tones [to] spread more quickly, by making it a simple process to get them on to most phones" and later, "once the infrastructure is in place, groups are likely to use ring tones as a standard part of their membership perks, some say." (Ringtonia 2005)

They are designated as "political viral messaging" by tech writer Justin Oberman in a feature on the music industry's growth in this market. Songs such as 'Call Connected through the NSA' with the lyrics, 'call connected through the NSA/complete transmission through the NSA/suspending your rights for the duration of the permanent war...' from the band *They Might Be Giants* are an example of how songs become protest ring tones and the industry still benefits. This example is also suggestive of the strong historical links between radical music and anti war media in the United States. (Oberman 2006)

Mobileactive.org

This section looks at one specific group, Mobile Active, which is dedicated to mobile activism in an effort to underscore the various ways in which mobile communications are influencing activism globally.

Mobile Active is 'a community of people and organizations using mobile phones for social impact'. (Mobile Active 2008) Mobile Active responds to the multitude of mobile phones owned and operated worldwide and 'unprecedented opportunities for organizing, communications, and service and information delivery' with which cell phones present us. (2008/9) It is an online social network of activists organizing international conferences, an updated blog, a Mobile Active wiki, archives and newsfeeds relevant to the mobile activist community. It is 'a resource for using mobile technology worldwide' and a place for 'activist words.' (2008/9) The community 'includes grassroots activists, NGO staff, intermediary organizations, content and service providers, and organizations that fund mobile technology projects.' (2008/9) Social networks such as MobileActive.org demonstrate for activists and researchers, the effects of wireless as they have been taken up within the already social practices of activist culture. Mobile Active serve as a 'cyber place' (in Wellman's terms) for the dispersed community of international activists to share ideas, events, and open resources for the understanding of and use of mobile tools. MobileActive08, an annual conference, took place in South Africa with an emphasis on mobile tools for mobile social innovation. Activists wrote of their work:

> We work together to create the resources NGOs need to effectively use mobile phones in their work: locally relevant content and services, support and learning opportunities and networks that help Mobile Actives connect to each other. With these things on hand, tens of thousands of NGOs will be in a better position to enrich and serve their communities. (2008/9)

DIY Cyborg: Steve Mann as Activist

Research on 'DIY wireless mobile media in the context of politicized events, was first published by Professor Steve Mann. Mann's wearables have placed mobility and affordability in the hands

of ordinary people since 1980 when his self-made wearable computer/personal imaging system foreshadowed the present era of wireless mobile media, especially those now worn on the ear, or hands free in an act of seamless liberation from, even, handsets and visibility. Steve Mann, however, has always been a critic of 'smart culture' per se. Publishing on smart clothing from MIT in 1996, he looked at using wearable multimedia to 'restore the technological balance between people and their environments'**.** (Mann 1996, 1-4**)** Taking Thomas Bass, author of *The Eudaemonic Pie* as his precedent, Mann articulates the imbalance between free human beings and the heavily proprietary thought patterns built into most consumer technology. Bass described 'the show-based computers of the 1970s that were designed and built by physicists and other researchers in California for purposes of assisting them in playing roulette.' (Mann 1996, 5) Concerned in his own critique with issues of privacy, Mann was intrigued by shoe-based computers that could be so unobtrusive as to pass 'the casino test, surviving the scrutiny of the croupiers and pit bosses.' (1996, 5) He writes:

> It is also truly ironic that these computers were being used ---in a place were privacy would otherwise be unthinkable (under the 'eye in the sky', the partially- silvered ceiling mirrors and the ubiquitous ceiling of domes of wine-dark opacity that are pervasive throughout most casinos. (1996, 5)

He is referring to the abundant use of surveillance in the profit driven casino. Redressing the technological balance, therefore, would be to invent a device that would allow one to cheat at cards undetected; while being under full detection the entire time. This is his analogy to contemporary urban surveillance, new technologies, and privacy of human beings. Mann writes:

> …ham radio hobbyists' using voice communications on their hand held battery operated radios or wearing head sets and hands free microphones, sometimes together with 'antenna hats' and quite similar to the author's [head mounted apparatus] to stay in touch with each other as part of their day to day lifestyle…(1996,5)

This is the 'community of nomads' (1996, 5) he had in mind for mobile networks. Mann and his students experimented in detail with many-to-many mobile social networks, making their own

gear and staying connected over lengthy periods. The effects of constant, uninterrupted connectivity could be observed. The wirelessly networked communities connected through antennae from MIT Roofnet, a community-based free network. (Aguayo et al, 2003; Dey 2007) One network involved 'three with Wear Cams, and others with 'cellular hats' and LCD-based Wear Cams' focused on safety issues. (Mann 1996: 11) 'The displays', he writes, 'are the most obtrusive pars of these systems – cameras, microphones, computers, and input devices…are almost completely invisible.' (1996: 11) Mann has since created less obtrusive DIY displays embedded into ordinary sunglasses, but differing in their functionality, of course. In 1996, he called this 'smart clothing.'

> 'Smart clothing' differs from employer-owned technology or technology controlled by an external entity (the most extreme case being devices used to track criminals.) In particular, it is owned, operated, and controlled by the wearer…It is primarily intended for living day to day within the surrounding social fabric of the individual. (1996, 5)

These experiments questioned the social relations of networked wearability where systems of control have been embedded and inscribed into the designs.

> 'In a networked wearable multimedia community, people might pay attention mostly to their immediate surroundings, but may, at times, get an image from someone who thinks there might be danger. This fear of danger might be triggered by a 'maybe I'm in distress' button pressed by the wearer…or be facilitated through a heart rate monitor and an activity meter/pedometer…such as the sensor sin the authors shoes.' (1996, 18)

Mann is responsible, thus, for having invented two systems: non-proprietary Weartap and Eyetap wearables, which nearly, completely synthesize data with physical experience in the act of seeing. Users retain considerable intellectual and personal autonomy because the clothing/system is, fore mostly, self-designed.

> Our clothing of the future may some day be interoperable and interconnected so that it keeps track of our physical condition and allows us to decrypt this information for evaluation by a doctor or other profession of our choosing. (1996, 17)

His inventions have also pioneered the application of wearable technologies to political survival. His students wore the Eyetap system as activists. They reported "live" on the Ontario Coalition Against Poverty 2000 protests in Toronto by streaming images nearly perfectly synchronized with their own vision and 'capturing almost by accident the entire protest', an event largely ignored in the media. Mann's group nearly continuously broadcast what they saw. (Mann with Niedzviecki, 2002, 175-7.)This research, then, ignites the self-mobilization, autonomy and self-representation trope, discussed earlier in the writings of Shumway, Atton, and Downing. Mann deliberately proposes a future of wearability, self-designed and infinitely more complex and networkable, than the current state of *civilian* wireless. His research informs debates around militarization of space, what Armitage, Crandall, Davis and others have queried in terms of architecture, the body, and urbanism: 'how military logic enters into the field of representation and the very structure of perception…here you must bring militaristic issues down to the home front, dealing with personal and psychic defenses and ground-level practices of subjectivization'. (Armitage and Crandall 2005: 18) Note: See Chapter 4 and 7 on Steve Mann.

Conclusions

Mobile media use in activism has thus been seen to do several things: One, to displace older methods for movement organizing and the distribution of information, including paper leafleting, walkie-talkie announcements, and word-of-mouth. Mobile media has augmented older methods successfully across the social space of protests. Two, mobile media has created psychological unity inside large demonstrations and increased personal sense of political and civic engagement among demonstrators.

Thirdly is the issue of coordination of protest culture. Virtual communitarian Howard Rheingold wrote a definitive treatise on 'smart mobs' (2004) expressing his views on the internal politics of these group events and their potential for social transformation. Smart mobs are 'enabling people to connect to information and to other people, allowing a form of social coordination'. (Wikipedia 2009; 2005) Arguably, however, the politics and sociability of smart mobs or flash mobs is likely

to differ from that of demonstrations, direct action or protest, where coordination has more to do with the cause of the protest, and an historical struggle over time, than it does "belonging" to a temporary mob. Mobbing is a limited trend in mobile media and not especially socially transforming. The smart mob, while coming together via mobile networks, tends to be erratic and superfluous in its intentions, although occasionally probably effective in terms of activism. The point made here is mobile communications have brought some social change, based largely upon social affordances of the technology. Creative use has made projects out of designing the mobile landscape or questioning mobile means, but mobile media is not the answer to social and political challenges per se. In terms of dynamic flows in the establishment of community and place, mobile communications are valuable in this effort.

Lastly, about coordination, it is humbly argued that desire, not technology, creates coordination and if civic and democratic participation lies with better participatory media, then participation lies with fast free bandwidth and a sophisticated first generation 4g device. The ubiquity of tools acts as a platform for reception of micro broadcasting increasingly enhanced by better small screens and applications. Capacities for such media assists coordination of micro actions in protest culture and the making of immediate media. Further interrelationship of mobile tools with the web and new social media offers additional qualitative data exchange by and between users. Thus, new technologies bring activists to a new place. Video replaced super-eight filmmaking as the inexpensive home documentary format. Portable and instamatic photography made travel sketching passé. Bulk txt.ing (see section on txt.mobbing) was practiced before Twitter became popular and started producing rapid news updates and microblogging for larger, dispersed populations. In activist culture, low budget, easy-to-do, immediate methods of social media have driven social movement causes, often poorly funded, and have been the predominant means of information distribution. Photocopying visual communications, usually in conjunction with home computer set ups and printers, in the form of stickers, comics, and zines has a long history and a considerable aesthetic culture as byproducts of the political milieu. Photocopiers made guerrilla Xeroxing (US parlance), performed undercover, and during "business hours, " possible. (Notes of

the author.) Websites now supplant zines or act as portals for activist literature, merchandise, protest information and response. Chat, email and Skype supplant international telephony and e-newsletters are “broadcast” to e-lists and addresses. A major change in telecommunications in the United States has been that of paying for long-distance at different rates by the minute to a flat, per minute fee for long distance within national borders. This transformation cuts costs to households by hundreds of dollars per month and as the phone plays a pivotal role in political organizing in such a large country, Barack Obama’s campaign organizers, FreePress.org and Moveon.org phone-ins to talk out issues were inexpensive and produced support for his campaign. The conventional phone bank is rethought with simple-to-install mobile phone groups, requiring no physical location, only people with phones and internet access. Other phone-ins gather at a home and callers bring their own phones. Thus, in the mobile digital age, data can be circulated more widely and in the context of sophisticated networkable devices the possibilities of shooting and uploading video or using Face Time, adds to the palette of possible technologies on offer to activists.

CHAPTER 7

Mobile and Transnational Identities

> To understand the future of urban change, we must focus our attention upon the communication circuits, no matter how complex, by which people are connected to each other, make sense of their lives, and act upon the worlds that they see, in which they dwell, and through which they travel. (Smith 2004, 194)

> Settlements become a mobile species, and their movements are further accelerated by the multiple patterns of mobility made available by numerous overlapping networks. (Wigley 2004, 378)

Introduction: The Complexity of 'Newness'

The tendency to bespeak the 'new' in relation to wireless media is a 'contagious futurism'. (Hjorth 2007, 179) Hjorth identifies the 'conflation of mobility with futurism' as part a 'marking of it in terms of its migration of usages and meanings' (Agar 2003 in Hjorth 2007, 179) It is also an 'association with yuppies and conspicuous displays of wealth as demonstrated in the iconic 1980s film *Wall Street'*, partly as a 'complex creature adorned by user-generated customization' and finally 'accompanied by corporate smoke and mirrors around the so-called empowered user by way of user created content' and 'prosumer agency.' (2007, 179) She writes: 'In this climate of optimistic futurism, wireless media promised a further democratization of media,' (2007, 179) a decentralization and permeation of urban space. Affluent, educated, professional western cultures adopt new media technologies at the same dizzying pace as markets churns them out. But, *newness*, emerging as the promise of the *next* tool, as an answer to boredom with old tools, as a promotion of the minute modalities of empowerment from each new device or network plan, is imbued with 'the aesthetics of banality'. (Koskienen 2007 in Hjorth 2007, 179) Thus, the future

pulls us in through popular push consumption of wireless media, as if mesmerized, along with its visible *use*. Wireless communications are, however, increasingly diversified, further establishing the multi-headed, creature-likeness of its future. It intersects with the Internet, the Web, gaming, children's' toys, and other media and patterns flourish. A multitude of tools portrayed as essential, emerge, but, unlike this fast-paced flood of gadgets, contemporary wireless media is a recordable present, linked with the past. Communities see new technologies as an extension of what they have known, and use them, as this thesis has shown, because they are less expensive, more efficient and offer more communications possibility than others.

Wireless media continues to combine in complexity with broadcasting, recording, and social media; the Web and Internet. Its distribution and accessibility are part of an established architecture while designs in applications and software extend its communications capacities. Twitter, the popular mobile platform for micro blogging, has played an increasingly significant role in the personalizing of news transmission and reception. The reporting of Michael Jackson's death, for instance, was explosive news which started with a single celebrity websites. Subsequently, thousands upon thousands of tweeted messages launched on to the airwaves. The potentials of wireless media to be uniquely different in form from other far-reaching communications are evident. It is immediate and distributed and a rapid form of reporting via Twitters. Mobile devices and mobile networks no longer simply occupy roles of personal correspondence or as an extension of individual and family life. They are beginning to occupy, instead, spaces of communications much larger and potentially more powerful: networks of fans, for example, all fed celebrity news, or in the context of political networking, all informed in a state of immediate broadcasting. (See txt.mobbing experimentation in Chapter 6) The shape of wireless news is amorphous, an accumulation rather than vectoral. Images from MITs SENSABLECities project are data visualizations of place vis a vis mobile communications activity. They give way to our envisioning and interpreting the city in new ways as data becomes more complex and traceable.

Imagining Wirelessness

'Interactivity, personalization, miniaturization and co-presence' (Hjorth 2007, 185), being simultaneously here and there, virtual and actual in which end-users find themselves immersed and which have been investigated by 'practitioners such as Blast Theory and Proboscis/Urban Tapestries social research' (2007, 185) drive the multimodal, multidimensional and relational, and even disembodied, *imagination of wirelessness*. Satellite mapping technologies change perception of the globe to one of pinpoint locations within precise zones of a few measurable feet. Bird's eye views access remote regions, in Google Earth's virtual cartographies and landscapes. At one time the shock of the new lay in the remarkable photograph of Earth from outer space of 'a sparkling blue ball hanging in the dark void (Mitchell 2003, 30). This one shot, broadcast live on television from outer space, replayed and republished widely in print is a singular event, a function of its technology, echoing the logic of the establishing shot, which is completely pre-digital.

Google's shots of Earth are, rather, on the web, that is, capable of being looked at from anywhere by anyone with a browser, screen and Internet connection. The watery blue ball, endlessly and meticulously reproduced, is now consisting of millions and millions of views accessed each minute, each day, not by astronauts' location, but by millions of computing viewers. At the same time, the viewer is strangely flying and zooming, evoking Manovich's 'tiny camera', and his mobile viewer argument for the absorption of avant-garde cinema into new software practices. (Manovich/Kunstform 1995, 2002; Schwarzer, 2004)Device users armed with intimate GPS data, antennae and repeaters, operating on communications-based *coordinates*, maps and information networks meshed with satellites.

Critical Interpretations of Wireless Culture

Critical examination of mobile spatial culture takes us to 'the domestic technologies method', or what Ling (2004 in Hjorth 2007, 181) describes as 'the process of engagement with technologies undergoing various stages or nodes of a cycle that include imagination, appropriation, objectification, incorporation, and conversion' (2004, 28 in Hjorth 2007, 181). This version of wireless media sees 'consumption as an ongoing process that is perpetually negotiated...' which

'becomes a part of our own social identity' (2004: 27 in Hjorth 2007, 181) and for ethnographic research forms the basis of understanding how a particular culture or individuals within culture respond to a new technology. Other perspectives on wireless focus not on the personal absorption of the medium as much s they do the language, make up, and "capacities" of coordinated wireless mobility. For example, terms such as 'micro coordination' are terms of strategy. Strategic thinking has more to do with the use of the tool, and its applicability to situations, than it does the creative absorption of the tool as a cultural object. Anthony Townsends' urban metabolism, that mobile telephony 'quickens…the pace of urban life at an aggregate level', lends itself to a wirelessness conceived only in terms of personal, individualistic, empowerment, as a tool for capitalizing on time and space, and involves the planning of both cities and time. (Townsend 2000, 1) "Strategic thinking" plays out as an influential cultural idea across in various interpretations of what wirelessness or new technologies might mean. Lisa Nakamura, in her brilliant literary analysis of racism and globalization, for instance, considers the entire project and descriptive language of the World Wide Web to be inscribed with racially loaded Westernized paradigms of expansion and colonization. Her work on 'cyber types' (2002) argues that narratives of travel and exploration, historically bound to quests for western culturally imperial domination of other lands and peoples is an inherently racist history without real substance in the material violence of how these entities are formed. The idiom of "travel" is all over the mobile/navigational wireless imaginaries in commercial cellular and wireless marketing. It persists in its presentation of an "Other", however altered by the scale of mobile devices, the relations of social media, and/or perceived wireless independence from culture, nation or society. In a recent bill board advertisement for Google this hyper-colonial position is depicted. General George Washington is crossing the Potomac, as in the large, famous nationalistic painting by German American painter Emanuel Leutze. (1851) In the billboard version, Washington is using a handheld device (perhaps manufactured in Japan, Korea or Finland) thus deemed capable of expert navigation. Militarism and American-centric technological history integrally entwine in the symbolism of the country's origins as a free nation, equipped with revolutionary power. The tool embedded into an historic, national drama, is a signifier of display, identity, "newness" (the

painting is updated). It is a blithe appropriation of events, history and place, obscuring the meaning of mobile communications and Google networks in any other context, a familiar market formula. In other advertising, exotic "place", for instance, "tropical beaches" and mobile work styles are visually linked. This connects networked individualism with "the exotic" and the exotic with states of new technology. (Gregg 2008; Nakamura 2002).

Research Approaches

In mobile research published from approximately 1999 – 2007, there have been decidedly two approaches to thought in this new field. On the one hand, and depending, on the culture from which the research emerges, scholars and artists have self-consciously focused upon hyper local, sub cultural and ethnographic studies of communications mobility or have asserted the need for recognizing mobile culture and differences between "mobilities" on these grounds. Australian mobile research expert, Gerard Goggin has been one of the key academic and research proponents asserting the critical importance of cultural difference in this arena, as has Australian lecturer and games researcher Larissa Hjorth, from RMIT, who has conducted influential work with Japanese subcultures and among women. On the other hand, many scholars, theorists, and artists, also refer to mobile culture in more global and extension-based terms, appealing to global notions of networked space and more universal notions of networked space, or to direct retooling of technologies to create networked communication. This scholarly strand tends to emphasize factual technologies, techno culture, statistics and trends, as opposed to personal use, although, arguably, some areas of this research are highly personal. Manuel Castells' et al, for instance, in their seminal book on mobile communications (2007) make a self-conscious effort to take on the entire global mobile communications "picture" in terms of critical topic, statistics and research studies, producing a definitive, factual, and authoritative account of this new arena of communications. The next two sections discuss these two distinct "voices" in detail and offer examples.

Hyper local, Sub cultural, Personal Media Research

Mobile cultural research focuses upon the immediacy of co-present sense of place, "niche"

cultures, and ‘domesticating technologies’ (Goggin, Hjorth, Ling, Ito, Matsuda, Milne, Williams, and others). This focus is of considerable epistemological and ethnographic importance in the growing body of knowledge comprising wireless mobile media studies. Australian media culture is interesting for pushing mobile research in the Asia Pacific in this direction, and moving the focus of the wireless imagination from abstract “networks” to the politics and place-based context of personal use. Participating in *Mobile media 2007,* an international conference at the University of Technology in Sydney, organized by Goggin, Hjorth, and others, introduced an international palette of mobile researchers to elements of this cultural emerging mobile urban space. The project included international papers on mobile phone cultures, mobile identities and practices, youth and mobiles, wireless media, gaming culture, mobile music culture, new textualities, visual, journalism and wireless educational cultures. The collection emphasizes localized mobile practices, including SMS and MMS, informed studies of personalized wireless subcultures, initiatives of intimate, local, and urban mobile communications to become public art, use urban screens, create border crossing projects, discuss avatars (Cleland), posit mobile identities, discuss wireless-based cultural consumption, critique risks of brain cancer (Sutherland), show courtship in the Philippines, demonstrate use by children and young adults, explore psychology and Australian youth culture, transience, and talk about networked selves and mobility in Venezuela. (Goggin and Hjorth 2007, eds.)

Global Mobile Networks

Another prominent “voice” in mobile research culture is that which references Castells' seminal “space of flows” concept and emphasizes geopolitical and global communications. Jose Perez de Lama, William J. Mitchell, and other theorists use global and networked theoretical positions in their discussion and application of mobile media. This is research that engages with conceptions of the extension of communications vis a vis electronic networks, and which utilizes influential perspectives on Internet culture as an exemplar of how mobile media works. Regional and urban infrastructural development of wireless, capacity for communications reach in international and transnational circumstances, and multi-layered effects of wireless mobile communications upon

cities, institutions and groups tends also to be a focus. Likewise, affordances in the technology especially its portability and technological "networkability" (meaning set up of network and transmission devices) tends to be paramount. Scholarship in this area, tends to assume a certain level of global travel among users, thus examines the culture of wireless media communications from within the technologies' ability to be flexible under these circumstances. This research also tends to call users *cyborgs* and *nomads*, often viewing networks from a critical "outside: *Headmap*, the wireless nomadic research group, explores wireless mobility, for example, with an emphasis on nomadic lifestyle and temporary shelter, and they predict a future wireless lifestyle for recording and participating. (Headmap' 2001). *Hackitecture.net* has produced 'camp' events which bridge geopolitical zones, regions (Fadiate 2004; Cartuja Beta Rave 2003; TCS2, 2007) and spaces, creating electronic community with projections, transmissions, and online presence over temporary wireless networks, or in order to communicate between, and within, geographically constructed spaces in certain locales. Hackitecture is essentially an effort to create space out of intangibles: 'electronic flows, interfaces, audio, projections, words, bodies, the landscape…' (Perez de Lama 2004, 4)

In these two projects, the technological context for mobility/nomadicity, defines the ability to wirelessly communicate, map and record that context. The politics of use lies in the ability to be technological, rely upon communications to build identity, thus, to make space through synchronous and asynchronous communication. Portability, power to create cyber place "anywhere", capacity to reconfigure portable, wireless media devices in new spaces, the knowledge to do so, all are the essence of hackitecture. In this strain of thought and this brand of research, social and cultural space is viewed as existing through the capacities of the technology to produce a social and cultural experience.

Discussion of Research Approaches

In summary, the first tendency is grounded in an ethnographic, experiential approach, while the

second, the space of 'networked flows' utilizes approaches derived from non-geographic and extensive concepts. Both tendencies express concerns for the portable, wireless device, the network, and what role these play in making or reinforcing mobile culture. However, the first approach is ethnographic, looking at a mobile culture through the lens of other culture, in order to study it, and drawing connections between the two. In the *Mobile media 2007*, document, for example, there are examples of projects worked on in highly localized networks and practices: the types of tools being used; and the types of networks: MMS, SMS, cellular, wireless, GPS are all a reflection of what, often, ordinary users have at their disposal. Examinations of multiple technologies and multifunctional devices and tools suggest a broadened scope to wireless culture as communications space and focuses upon the cell phone and text messaging as prevailing technologies. A definitive history of hackitecture has yet to be written, but hackitecture, bases its work upon tools and their networkability: the sharing of laptops, data projections and portable wireless antennae, not explicitly cell phone culture or texting practices. It is an idea about the use of technology in the service of a particular situation and it often points out how culturally determined public sense of technologies can be, when making networks and transmission is concerned. Thus wireless communications, according to hackitecture, is not about mobile media as a culture per se, but about the knowledge and sharing of tools, including antennae and data projectors, and making communication space. It is precisely about the provisional aspect of mobile tools, not their ubiquity as a "landscape", except where reception is concerned. Hackitecture works best where it adds and extends existing connectivity. The techno-culture of hacktivism thus differs to those mobile cultures where cell phones are considered the primary tool, When Gene Hackman links to the Internet with a wireless laptop via a cell phone connection in *Enemy of the State* (1997) this is pure hackitecture. Both the connection and the connected tool are wireless. Hackitecture media, thus, is a planned community that emerges as an ad hocracy between tools and networks over borders and geographies as much as it is wireless media that varies culturally and group-to-group. Each time, it is appeals to the notion of growing the culture and, often, transcending borders to do so.

Wireless Identity

In order to participate in society to the fullest ability, people need to communicate. Mobile media offers yet another channel, or access point, for controlling, observing and speaking one's relation to the city. Architecture, urban planning, households and bodies intersect within this context creating fresh associations within the city. Urban space is created through, forms of mobile identity. It is an identity which is multimodal and relational, to borrow from French cultural critic Nicholas Bourriard. (Bourriard 2002) Mobile media allies itself with architecture, citizenship, and identity; to cities, community, and technologies. The manner it adheres to urban form: existing buildings, antennae and high places in its discreet infrastructure, it is already enmeshed and enmeshing with urban space, yet, its primary visual "carrier" is the body itself.

As early as 1982, Donna J. Haraway offered a respectable alternative identity to the business-oriented techno determinism dominating the emerging personal computing and digital culture. In *The Cyborg Manifesto*, Haraway argues there must be a way out of power relations set forth by techno industries, accusing miniaturization of 'turning out to be all about power.'(Haraway 1982 in Trend, ed, 2001: 30) Her critique was designed to undermine the popular notion that anything significantly revolutionary underlies so-called technological revolution. Since then, numerous voices have joined her to review all manner of oversimplified, reductive ideas about the presumed social value of technology.

In the mid 1990s Steve Mann, attacked proprietary corporatization and the industry invention of 'smart space' as a form of insidious social control, asserting that the imbalance between proprietary and personal technology needed be redressed. (Mann 1996) He points out the difficulties of manufactured 'smart' tools and spaces invented and the inability of 'all environments to be so equipped' (1996: 2). There 'is no guarantee' that those 'behind the infrastructure' he writes, 'would not put their needs before ours' and he discusses the negative of surveillance as 'numerous examples in which organizations have abused their capability to covertly monitor their members'. (1996: 2) (See also Sections 3.1, 4. on Mann) Asserting the need for technological free thought with respect to smart technologies, Mann became a leading

proponent of DIY mobile, wearable computers, creating those 'systems designed and built…for experiments in personal imaging.' (1996:4) His polemics place the construction of mobility (especially as related to imaging) at the epicenter of design and implementation of personal technologies. His research postulates how else these electronic devices could be made creative. Shadowing Haraway in his ownership, overhaul and reconsideration of the cyborg (Mann/Niedzviecki 2001, 9-77) when confronted by its technological emergence as a species of user within culture and the possibilities of political action in this context, he writes:

> We are at a unique stage in history, a time when it is possible to facilitate a dispersal of personal technologies that could counteract repression through ubiquity and diffusion. This opportunity to enhance human possibility is the reason why we must insist that wearable computers, not be uniforms tied to specific functions but rather overall systems that include human beings in the cybernetic loop… (2001, 73)

Practicality and Mobile Devices

Cell phones are beneficial in emergences and very convenient otherwise for organizing daily life. Only relatively recently have they begun to be used on any widespread level as an entertainment device. Their function has been phone calling, texting, and then more recently, GPS and phone photography, mapping and location or navigational information collection. Western women are most likely 'to prioritize safety and security as reasons for acquiring a mobile phone' (Scott et al. n.d.; Johnson 2003: Plant 2003a; Gergen 2005: IDC 2005; Lemish and Cohen 2005b in Castells et al 2007, 45) or when influenced by AT &T feel that 'the mobile phone…is a woman's best friend. (Townsend 2000: 6)

Personalizing Screens

More recently, particularly with tools such as iPhones, Blackberries, gaming devices, Android phones, the collusion of music, games, entertainment, GPS mapping and so forth, makes multifunctional device-use competitive with phone calling as the main form of mobile data usage. Practicality, however, despite this empire of "choice" runs through market advertising. Users want to keep in touch, make business calls, stay safe, and get information. Through new

applications, however, they can now also play games, listen to music, and, of course, watch movies. Even exciting, new applications are presented with a practical and productive side, however. Users are encouraged to take entertainment along (not to get bored in transit) study in the elevator (not waste time), block out unwanted noise (preserve their privacy) and especially, users like to "work" in transit. Just where the drive for this urbanization comes from, supply or demand, is not clear. Networked devices also act as applications stores, 24/7 but, with respect to everyday practices and as the increasingly electronic urban interface, wireless devices are screens upon which to find information. They substitute for old paper products: telephone books, maps and directories. They allow better navigation of the city: GPS mapping, weather and temperature, timetables, and more. Mobile banking and parking ticket payment, among other city departmental information accessible by remote, mobile tool, are common and save time.

Mobile Workforce and the Shape of Flows

Transitions from fixed computing to mobile communications are frequent in mobile communications advertising. Commercials focus either on individual use or on the individual within the ultra-networked context of mobile workplaces. Billboard advertisements for Verizon Network in downtown San Francisco, displays a workforce of hardhat-wearing workers, all connected by mobile network. They are similarly attired, efficient and productive, through their wireless Verizon usage. (Notes of the author) In a television commercial for Cingular, a typical male construction worker (with hardhat, sweatshirt and jeans) is ankle deep in slowly hardening cement. His co worker calls to him from a distance, waving his cell phone, 'You got to get connected…this is where it's at…' and a crowd gathers behind him, while the man, stuck in cement, struggles helplessly, to move. (Notes of the author)The advertisement depicts personal fixity as an isolated, debilitating condition of lack, while encouraging wireless devices in workplace involvement and sense of belonging. These commercials pitch wireless to employers and business owners, with the promise of productivity and unity; however, they also speak to the individual employee or potential employee that s/he is behind the times without a mobile device. The fully networked urban experience achieved by Mitchell's cyborg is rare at the consumer level, however. Sophisticated new devices such as iPhones and Blackberries are quite amazing,

but are also prone to network drop out and are cost prohibitive on a monthly basis for most people. Glitches with the antenna of the iPhone4 were widely publicized, so they are not without flaw. Anthony Townsend points out the fundamental lack in lab fantasies of 'seamless global access' when he affirms that in truth, 'the potential spatial and social implications of these new infrastructural networks must be identified and explored.' (Townsend 2004, 1) Neither advertisements nor Mitchell's critical writing explore the makeup and shape of networks into which their actors are stepping. However, art projects have explored the shape of networks in explicit relation to the city as interface, GPS, mobility and GIS. *10-dencies* by Knowbotics Research, is cited by curator Steve Dietz, as a project that examines not the real physical space of the city, but, instead, urban flows:

> One of the places where process is most apparent is the constantly morphing city. Knowbotic Research's IO_dencies project 'combines physical, local urban dynamics…with virtual network flows (the activities of the participants in the net). The movement towards 'an other city' [is] generated by manipulating, operating and modifying the urban flows' (Dietz 2002)

Dietz's discussion points out dialogues on the '10dencies' project and creative nomads, citing curator Yukiko Shikata's comment that 'no one person had or could have the overall view of the various flows. There could be no master narrative'. (Dietz 2002)

This idea of space, of the space of flows, appeals to the idea of many-to-many communication as a form or shape of network flow. Likewise, Petra Gemeinboeck, Andy Dong, and Francesca Veronesi's have created locative media works: *Impossible Geographies 02: Urban Fiction, Mapping Footprints*, and *Lost Geographies in the Australian Landscape*. These projects experiment with ideas of 'imagining the city as a playground of shifting spaces and fluid connections.' They write: 'If we want to open up the map, unsettle locations and unfix relations, we have to change the mapping process itself.' (Gemeinboeck, et al, 2007, 13) The artists utilized original media infrastructure including 'particle grids' for exploring 'the constitution of territories and their fault lines, and how we belong to and hybridize these charged terrains.'(2007, 15, 14)

The particle grids help 'mould a digital urban fabric out of participants' locations (BGPS data), the participants' motion is registered through accelerometers connected to the mobile device, and images recorded on site to a central server.' (2007, 14-5) 'A computational process…interprets, mixes and puts into context these data streams with other information about these places, such as…GIS data' and this mix is in turn 'returned to the mobile phones' where it is 'rendered and displayed on the screen.' (2007, 15) This process of looping feedback creates unique participation, 'the iterative changes of the digital fabric' 'between the inhabitants' practices, the terrain and archived territorial knowledges'. For the participant experience is produced with data generated by other participants and the community of users. Multiple visual tracings of data, emerging from boundaries between users, territories of users, and locations of users become fundamental visualizations of the creative shape of flows. Here, participation in the network consists of experiencing the network as a field. By contrast to hegemonic visualizations of wireless workplaces, or its standardization through limited, commercial representation, subjective, experiential difference in the design and perception of location, urban space and maps, when emerging from mobile networks, may admit new possibilities for considering "the urban" and acknowledge a multitude of social and physical conditions at the core of daily existence.

Urban Techno art and Location

Techno art challenges normative thinking patterns delineated by proprietary software, device manufacture and, in mobile communications, the parameters of fixity.

•**The Bureau of Inverse Technology** (BIT) employs wireless devices to establish a critique of techno culture through acts of cultural sabotage. BIT plane was a remote controlled toy airplane equipped with a wireless video camera flown over Silicon Valley taking surreptitious aerial photographs. Too small to be visible on radar, BIT Plane was able to infiltrate restricted airspace over Silicon Valley (Bit Plane 2002) in what amounted to a reversed act of surveillance.

•**Natalie Jerimijenko** hacks battery-operated, commercially produced, toy robotic dogs and reassembles them to sniff out volatile organic compounds in local environments. This work reveals how toys are programmed and repurposes them for purposes that are more "intelligent".

(Feral Robotic Dogs 2009)

•**Beatriz da Costa** of the Critical Art Ensemble released carrier pigeons over San Jose equipped with miniature backpacks of wireless tools which could read data on air toxins and remotely transmit the data to a website while in flight. The carrier pigeons' flight paths and pollution data could be observed from the ground via the web. This artwork expresses the social affordance of micro mobility in wireless use. The US Environmental Protection Agency's methods were in 2006, when the piece was made, only capable of data gathering from within range of the Agency's stationary sensors. De Cost humorously puts a uniquely useless bird to use by loading it up with tiny, powerful wireless technology.

While there are other possible readings for all of these works, the common thread is the use of miniature, wireless technologies to outperform other tools and networks or to go where fixed tools cannot. They make a statement made possibilities inherent in new technology culture, ones that can take humanity beyond its current spatial configurations. In these unique works of techno-art, aerial views, data, surveillance and everyday uses of wireless media in cities is reworked and reformed.

Dividuals, Cyborgs and Mobile Subjects

In his seminal essay, 'Postscript on Societies of Control' Gilles Deleuze asserts the concept of the 'dividual' or the newly numerated individual divided as a single identity amidst growing data networks. This identity is diffused into banking and financing networks leaving traces of self: addresses, data, numbers, and passwords, in the act of inhabiting, surfing, traversing networked space. William Mitchell also asserts a citizen of the networked city, a navigating, wireless cyborg, part human and part machine. This cyborg citizen is equipped with state of the art wearable technologies and symbolizes the intersection of wireless human mobility, the urban interface and urban planning. Mitchell offers biological metaphors, such as the nervous system, for connective and extensive aspects of wirelessness; the synaptic bond between body and city. The cyborg's wireless mobile interface navigates the city through connectivity to networks. Critical mediations

of personal boundaries, development of customized coordinated data of the city, and the potential for augmented reality are within the cyborg's reach. (Mitchell 2003: 39, 41, 227n38, 228n43) This cyborg is suspended, as it were, forming a space between and within networks. Steve Mann's imagined 'land warrior' (1996: 18) was an urban citizen technologically linked to militarism and earlier modes of defensive architecture. He redefined this through an experimental apparatus of wearable computers that allowed him to interface "inside" this politics of control and question the role of privacy in technologicalized Westernculture. (See Sections 3.1, 4.) Finally, urban theorist, Michael Peter Smith, in his critique of global cities discourse that obscures complexities of urban communications, engages a transnational mobile subject. This subject is an identity formed between communities and in the context of urban immigrant communications. Each author offers a critical framework from which to view composite factors in mobile subjectivity, which shall be explored further.

Mitchell's Cyborg and Hackitecture

In a paper entitled, 'Public Space and Electronic Flows', Jose Perez de Lama, recounts the philosophy and experiences of hackitecture.net, a group of hacker artists (c. 2004) who created temporary autonomous events they call 'hackitecture.' In his paper, hackitecture is discussed as a relation of territorial cyborgs, citing Mitchell. The author states:

> [Mitchell] proposes that the new inhabitant for whom it would be necessary to contemplate architecture must cease to be the isolated individual, centre and measure of all things (of humanism) and become a 'spatially extended cyborg.' (de Lama 2004, 3)

Seen as part of ecological thinking, the cyborg embodies 'the idea that we are part of an interconnected, interdependent world in which mediation between the physical universe and us humans, is carried out through…networks...machine ecology…(2004, 3; Guattari in Perez de Lama 2004, 3n9). Architect Toyo Ito writes of this territorial cyborg that it 'presents the situation as the desire for a new body'. (Ito in Perez de Lama, 2004: 3) He has also written of the 'desire for an android body' or 'body of the modern movement' (Ito 1988, 45 – 80 in Perez de Lama 2004: 3n11). The architect's conception of this modern body is the nomadic one, 'a body that

floats simultaneously between natural flows and electronic ones, in search of a house that does not exist yet'. (2004: 3) Through these ideas of body and cyborg, Perez de Lama defines hackitecture as:

> a series of prototypes of connected public spaces…The concept of hackitecture itself proposes a practice which recombines physical spaces, electronic flows and social bodies, carried out by teams of architects, programmers, and citizen activists.' (2004, 4)

The author adds female to the predominant male-orientation of the cyborg, suggesting that the state of 'spatially extended cyborgian' existence which Mitchell describes, is not a 'statement about identity or essence, but is…related to performance, to becoming.' (Perez de Lama 2004, 3)

Deleuze's Dark Critique and Power Relations

In the emerging societies of control, Deleuze is largely concerned with workers and their spatialization, comparing the factory to the corporation and declaring that the ideal citizen of the new society of control is the man in debt (Deleuze 1988 in Graham 2004, 74), meaning, it is argued here, that by keeping society endlessly in debt, control is asserted. Contemporary globalized economies have created abundant debt, abundant credit swindles, and the hybridization of "so-called" value chains linked in economic terms of brand identification and pin numbers across markets. Distributed ownership and stake holding precludes the default onto any one brand or owner in a crisis. These conglomerates distribute profit, and then aggregate that distributed profit. This strategy is particularly evident in Web and mall culture, where by signing on, one is "doing business" with several entities simultaneously as the ads and "choices" would suggest. This modus operandi establishes itself at the expense of (if not in total criminal intent) the globalized consumer and exemplifies Deleuze's notion of dispersed power and infinite networks. There appears to be no limit on what a consumer can choose or what he or she can afford. In addition, credit assures this. Processes of globalization have created huge third world debt as well, and intense home loan swindles where middlemen reaped profit as mediators between loaning institutions and buyers. This lack of accountability was recently recognized in the collapse of the US stock market and number of foreclosures. But, the inhabitant of any society

of control, if he or she is to have any power, requires visibility and this empowered user is borne out by both Mitchell and Perez de Lama, not simply as the viewer of networked screen culture, but as a figure capable of managing and exploiting the mechanisms of control. The fully mobile-networked "citizen" (undocumented persons not withstanding) would be Mitchell's cyborg, Perez de Lama's cyborg/hackitect, or Steve Mann's cyborg/self.

Deleuze also offers an anarchist critique of capitalism and the state. He points to conditions in which 'attempts at social control are now organized through extended webs of electronic monitoring and surveillance facilitated by ICTs (sensors, telecommunications systems, electronic transaction and tracking systems, databases, CCTV cameras and so on' as Stephen Graham points out. (Graham 2003, 72) Deleuze's theory posits that specific socio-technological reasons reside behind new forms of social control. 'The possibilities offered by these new techniques', Deleuze suggests, are leading to 'a crisis of all environments of enclosure'. (Deleuze 1988 in Graham 2003, 74) A crisis of enclosure, arguably, is a crisis about security: national, institutional, and private. The new Arizona state laws around Mexican immigration in the US are about a crisis of enclosure, "the border" being the site of context and the required imaginary to support anti-immigrant policies**.** New forms and ideologies of social control involved in the surveillance of borders, thus 'float free from the disciplinary, enclosed spaces veering into a virtually infinite array of extended, and often invisible ICTs systems.' (Graham 2003, 73) Deleuze's theory points to the industries of markets and banking, credit and identity, industries which absorb controlling ideologies and are 'strung out across the times and spaces of contemporary societies, from the body to global scales' (2003, 73). Location, identities, numbers, traces are reached by the splintered space, no longer the one-way vector, but the long arm(s) and tentacles of market research, in turn, the negotiable landscape of networked 'dividualism.'

Contrasting Cyborgs and Selfhood

While Deleuze deserts the strung out dividual in an isolated, financially distended, apolitical framework, technologically empowered cyborgs probe the numerous boundaries through which dividualized data passes. Mitchell's paradigm results in a networked self, optimizing both the

boundary-making and boundary-free potentials of electronic extension. His smart citizen evolves amidst an urbanized, ideal condition of high-speed bandwidth and technological expertise. This cyborg can be overheard in the supermarket, checking recipes on his iPhone4, to purchase the desired ingredients, thus, saving time, money and inconvenience. Signifiers of 'home' –the virtual cookbook—are overlapped with his store location. Mitchell overly dramatizes the technologicalized cyborgian body in an effort to make literary comment upon, it is argued here, this entity's less desirable side; his capacity to be detached from, and alienated from the social fabric. Mitchell's networked city is deeply modern in this way. His cyborg is an expression of both autonomy and alienation: the limitations of electronic media as a social tool and the body's dependence upon it for surviving the networked city. Mobile communications can be, after all, *wall forming* in addition to being "connective." While Mitchell satisfies the reader with descriptions of wirelessness, this cyborg is primarily concerned with the urbane processes of navigating the city. The *Transborder Tools* project, also under the name of 'walkingtools' (the innovative application) by b.a.n.g. lab, Brett Stalbaum, and Ricardo Dominguez, offers unique perspective on how cheap cell phones, with originally designed, poetic interface, can relieve alienation. This team has designed a bilingual mobile application for inexpensive phones to enable Mexicans trying to cross the border through the desert to find water. The project is a human rights project from one standpoint, but politically, it questions also questions the role of imagination in conceiving of the cell phone as one kind of instrument over another, and of the politics of airwaves and borders. (http://www.walkingtools.net/) Mitchell's figure, the technologically-enabled cyborg can also be read as a fictive figure of pervasive techno deterministic spectacle ----the ultimate purveyor of innovation, know-how and media ownership, in an allegedly "neutral" cultural context of ' the city', a Nakamurian-type 'navigator'. The neutrality of this figure is then the dystopian alienation. Dominguez, Stalbaum, and others, in their hactivism at the border, have created autonomy; an uncontrolled networked body. A mobile technologically enabled networked border-crossing cyborg, which interfaces with and navigates the Sounthwestern United States desert. This wireless subject is shaping networks from an autonomous perspective: a powerful selfhood and politicized subjectivity of cyborgian

dimensions.

Non-technological Bodies and Variability

Non-technologicalized time, "downtime, " balances the mediation of multi-valent, many-to-many electronic space. It displaces spaces of continuous "connectivity" and flow, with other forms of social space, such as face-to-face, or putting observation of non-electronic, built-spaces back into human interaction. Non-technological spaces, those created between people, not people and things, interrupt electronically mediated urbanism and the mind-maps of electronic space making in urban space. Non-technologicalized social interaction interrupts the 'space of flows' that is now, for many, particularly those in situated technological environments of institutions, the digital workplace. Digital dynamics played out on globalized networks possess the influence of non-technologicalized a synchronous time. In the United States, where commercialism is rampant in a free market context and there are huge quantities of billboards and advertisements (noticeably unlike Australian public space), non-technologicalized space is capable of preserving independence from commercialization and protecting the private self from the harsher elements of the city. It is a 'soft', non time-based space in contrast to many of the speedy and less promising associations one makes with technological environments, such as excess of light, office-like "feel", obsolescence, and unwanted spam or viruses. In Australia, by experience, technological reality, while capable of being analyzed spatially along the same lines as Chapter Two, does not carry the same "scary' and hyperbolic overtones as it does within America military-entertainment-industry complexes. However, in all cultures, some spaces strive to fall nearly completely outside of the commercial techno-culture. These would be, in terms of the body:

The 'ill self (which is non-hospitalized, or machine-dependent)

The 'sexual self (not enabled by machine)

The familial/parental self (interacting daily with children in a relatively non-technological framework)

Other workspaces where computerized technologies do not dominate.

These are all aspects of non-technological social space, the non-networked, non-technologicalized self; the self not consumed by technological interaction. These non-inhabitations do not belong to, or occupy space within dominant paradigms of technological discourse, which, even in the arts tend to privilege the act of "doing" as an act associated with new media or new technology, forget the context in which that work is done. Yet, they exist alongside all technologies, and they disrupt or vary the else wise "seamless", technologicalized space. Thus, they function as part of urban space, but with differing communications modalities from the presentation of the "ideally wired' and 'ideally wireless', or as with Gemeinboeck's *Impossible Geographies 2.0*, perhaps, dissolve, penetrate or create boundaries which can be mapped or visualized.

Hegemony

Healthy, young bodies and cultural neutrality are especially prevalent in commercial advertisements. They are what sell products to the mass society; their newness, sexiness, palatable lack of cultural meaning except within a monoculture of sameness. Early advertisements for iPods, featured large posters, pasted to city walls or on billboards. These images showed the silhouette (in black) of a faceless human form, apparently gyrating to music, against a flat, uniformly tinted background. The iPod instrument and the Mac Apple logo, also in white, also appeared, the former worn on the figure, the latter in the corner of he poster. Significantly, each silhouette, one per poster, was of a different human form. Features of biological gender such as the shape of breasts, or symbolically racial characteristics, such as dreadlocks were also apparent in many of the silhouettes. In other cases, figures appeared deliberately obscure as to gender and race. In all cases, the issue of class subordinated to the dominance of the egalitarianism of their facelessness, the reductive silhouette, and so forth. Political difference, however, while emphasized in terms of the appearance of "individuals", one per poster, was neutralized in this Apple ad campaign, by the lack of detail. Its appeal, it can be argued, was to world music fans, a genre that tends to make sound generic. The music listener/iPod owner is but one in an abstract, a cultural "crowd". Mitchell's electronically extended neutral cyborg can be critiqued as too neutral, despite the fact that Mitchell, at times, references himself as the cyborg. He has

constructed, as it were, a neutral figure. However, technology is never neutral and the simple elimination of differentiation and cultural meaning does not make it neutral. To eliminate characteristics of culture and class is, profoundly, to hegemonize the subject at hand. The advertisements create and reinforce a binary between the so-called technological (neutral) and the presence of the other, the lack. That which gives form and definition to human difference, the political, is effectively "neutralized" in this process. The Apple campaign synchronizes the commodity—iPod—with the absent and missing, which is human, as if all subjects were subsumed into the relations of the market and were, as it were, dancing in time with its music.

Ubicomp and De-emphasis on the Machine

To understand urban networked and mobile identity diverges from the banal, superficiality of Apple's aims at getting consumers to believe that 'everyone' has to have 'one', where 'everyone' is the generic figure, and 'one' is the commodity. By contrast, networked mobility is experienced through an interweaving of non-technological complexities and technological experience such that both, in a symbiosis, are considered social mediations--the *off time*--as it were, articulated as not being leashed (Arnold 2003a in Hjorth 2008, 2) or as an embodiment of new technologies such that "gap" between them and being "human" is closed. Any fascination with small-scale media devices is partly that they are portable but also that they are both powerful and non machine-like. The iPhone 4 is, fro example, glowing and user friendly, more like a sentient screen than a computer. Palm-sized, smooth, touchable, and customizable, iPhone4 embody desires for the obfuscation and sublimation of the machine. As tiny screens, they appear almost like pocket television sets, and the iPad only enlarges the touchable screen to which the touchable television may well be Apple's next step. In merging computing with the city came Weiser's longing for 'the computers themselves to vanish into the background'. (Weiser 1991 in Galloway 2004, 385) Ubiquitous computing started as an idea in the late 1980s. 'Researchers at Xerox Palo Alto Research Center (PARC) moved away from personal computing ---which they understood as forcing computers to the center of our attention….' (2004, 385) Ubicomp emerged from a desire to 'liberate us from the constraints of desktop computing, free us from equally isolating

immersive and simulated VR environments…."(Galloway 2004, 385)

Perspectives on Identity: Hegemony and Transnationalism

This section contrasts elements of global cities discourse with elements of transnational urbanism and architectural criticism. It uses the work of Saskia Sassen, Michael Peter Smith and Mark Wigley to develop an arena for understanding perspectives on globalization and urban space.

There are frequent references to cities as 'global' and extensive analysis of the meaning of 'globalization' of cities by contemporary theorists. One of the first to draw bead upon and define 'global cities' was eminent urbanist, Saskia Sassen, in her 2002 anthology, *Global Networks: Linked Cities.* This analysis, however useful for understanding global cities and networks, and focused upon 'cross-border flows' (2002, 1) and the 'organizational architecture' of global capital and financial markets, fails to embrace the myriad activities outside of economics which comprise global urbanism. (2002, 2) Sassen's analysis raises concerns about neglect of identities and types of mobilities under globalized conditions, especially when, in rare instances alone, the communication of non-capital oriented, non-profit, not-for-profit, and not fitting into the dominant economy or model as laid out by Sassen, is largely missing. Urban theorist, Michael Peter Smith, in his interesting book, *Transnational Urbanism: Locating Globalization* (2001) argues against binaries in 'global cities discourse' (2001, 2-3, 10, 12, 46-72, 75, 83, 90, 98, 112, 165, 172-4, 183) such as constructions of the "local" as an opposite of the "global'. He 'deconstructs central theoretical motifs found in the writings of David Harvey, John Friedman, Saskia Sassen, and the Los Angeles school of urban studies that have become virtual mantras of the omnipresence of capital in the formation of cities and human subjectivities'. (2001, 10) Smith posits a transnational urbanism against this 'omnipresence of capital' and emphasizes the growing influence of global social networks as part of communication, especially immigrant identities, in cities. He offers a social constructionist analysis of urban social space in this context and from the perspective of mobile identities.

Hegemonic Global Urbanism

There are numerous reasons to move beyond the simple 'global' categorization of cities, financial

capital and markets, and to consider approaches for understanding the effects of networked communications upon urban social space. The first reason would be that an analysis based upon faulty or limited, elite categorizations of the "global", in which this term, defined as an all encompassing set of presumed relations goes unchecked, cannot adequately account for the multiplicity of human activities within a given city. Cities are not simply to be read through financial statistical analysis, or as places of abstract flows. Even if they were, such an analysis of globalization, in as much as it attempts to encompass a totality of global trends, can only, arguably, represent one tiny horn of the vast terrain of comprising networked urban space. Co-existing on a variety of levels, besides market-driven competition and the hegemony of commodity-based consumer capital and "global" flows, cities exist apart from and in resistance to these common forms of commodifiable participation: advertising, hospitality, tourism, and travel industries. An unfortunate outcome of the acceptance of the authority of global cities discourse is that there is reproduction of monoculture and networked business models "on" the global network. Patrick Butler of *The Guardian UK*, observed in his recent article, 'Future of cities: Spark of inspiration', that 'many cities are trying to be distinctive, but many are doing it by copying others'. (Butler 2008) This copying is the spread of the neo-liberal appearance and economy to urban space: globalizing mall culture and real estate trends. The character and difference of urbanized areas is erased in the process of "global" trend making, creating cultural hegemony. In Sassen's insistence upon which cities have achieved global characteristics and which sit in a global network, she draws attention to how cities are defined by competition for markets as what makes them so-called global. (2002, 7) This economic emphasis, and the hierarchy of value chains and financial centers that go with it including the appearance of Starbucks 'everywhere,' is precisely the facet of 'global cities discourse' at which Smith levels his critique. That said it is a rich portrayal of the numerous worldwide cities as to how they work in the field of global capitalism. Mark Wigley, however, also comments on the encroaching immateriality of architecture in the face of networks, not so much as a critique of hegemony as a critique of lost buildings and material history:

> Space itself can only be seen when caught in the net. It is as if the modern perforation and lightening up of architecture in the face of speed, industrialized technology, and mass production of the twentieth century has gone a step farther as buildings dissolve into information flow, to be either discarded as a relic of a previous time or nostalgically preserved as a quaint memento. (Wigley 2004, 375)

Global trends, including those popularized through telecommunications and computer industries, focus on constructing location-based thinking through the lens of commercialization of space, as if space and place could become 'in common' by virtue of appearing the same, sounding the same, branding, and commodities, even when actually located in completely different climates, surroundings or urban spatial fabric.

Smith attacks global city discourse for constructing cities within an oppositional framework of 'global economic flows' in a 'dynamic but placeless logic' against 'a static image of place and local culture.' (Smith 2004: 54) This binary, he writes, 'loses…the cultural construction of economic spaces, the embeddings of economic action, the transnationalization of urban culture…and the issues of power and conflict underlying these social constructions.' (2004, 54) The transnational model for looking at global communications is an 'urban world of localized articulations, where sociocultural as well as political-economic relations criss-cross and obliterate sharp distinctions between inside and outside, local and global.' (2004, 67) 'Modernist social actors' Smith writes, are 'often viewed as stable, if not natural subjectivities, rather than socially constituted and hence, contestable representations. (2004, 140) The transnational subject, on the other hand, is seen as 'socially constructed…and the politics of difference that follows from this…as a historically modifiable process.' (2004, 140).

Transnational Subjectivities

Transnational urbanism starts 'with an awareness that the social space being analyzed might usefully be understood as a trans locality, a fluid cross-border space in which social actors interact with local and extra local institutions and social processes in the formation of power, meaning and identities.' (2004, 174) Mobility for the transnational subject is the capacity to maneuver between

communities, networks, platforms and technological identities. Understanding this subjectivity enables an urbanism that is more readily visible in terms of fluid, personal communications. Which flows of communications hold transnational social networks together is an unknown. 'The subject is neither natural nor universal, but always already in the process of being formed, displaced, and reformed.' (2004, 131) Quoting Lyotard, Smith offers the following:

> Each self exists in a fabric of relations that is now more complex and mobile than ever before. Young or old, man or woman, rich or poor, a person is always located at 'nodal points' of specific communications circuits...Or better, one is always located at a post through which various kinds of messages pass. No one is ever entirely powerless over the messages that traverse or position him or her at the post of sender, addressee, or referent. (Lyotard in Smith, 2004, 194)

The resulting transnational subjectivity is a combination of both shared transnational space and the onset of global communications where global communications have created conditions of transnationality, or the capacity to be a hybrid, neither belonging to one place or another, living, as it were, partly in the ether. It is of particular interest to the study of these communities, an identity often bound to particular predicaments, such as migration, and the development of existence within and without prescribed social roles. But Smith's critique also poses unique questions regarding the constitution of subjectivity and community explicitly with respect to mobile communications. He suggests that cultural differences may affect use of the medium and that social networks can be more easily developed, especially among historically, technologically underserved communities. All of this would surely influence urban space, the shape of its future, and the substance of its present.

Transnational Space

Smith locates authentic 'transnational urbanism' and its social construction within immigrant communities affected by NCTs and migration, citing the role of technologies in urban economies. (Smith 2004; 127, 133, 187) Social constructionist theory, he argues, is a better means for understanding urban identity than reliance upon global frameworks. (2004,133). Transnationalist

approaches offer greater opportunities for ethnographic study, as do notions of 'transnational space' for the study of urbanism. (2004, 137-43) In 'Transnational Digital Imaginaries' (1997), John Hess and Patricia Rodden Zimmerman, discuss various meanings of transnational space and give examples of 'transnational imaginaries' contributing to the ongoing narrative of globalizing networks, in which identity is harbored. Debates on transnational communications speak to Deleuze's 'loss of enclosure' where the experience of loss is a condition of urban space---borderlessness, a globalized cultural leaning---and one social, psychological effect of widespread global communications. Such notions of lost boundaries and enclosure support some interpretations of emancipatory technologies (UDC 2007), hybrid identities and forms. For instance, the 'blobchitecture' evoked in Chapter 4, with its amorphous constellations of non-ness, idiosyncratic and hybrid shape, are architectural examples of transnational (and transitional) space. Future Systems Selfridge department store in downtown Birmingham, UK, is an enormous blob, more a cultural than "futuristic." This bizarre-looking architecture is a byproduct of collaboration and software. (Future Systems1997, http://www.future-systems.com/architecture/architecture_list.html) Similarly, 'transdisciplinary' or 'trans institutional' identity, like trans nationality but not having to do with absence of national borders, is a non-geographically specific formulation. It exists in realms of globally networked information affecting all possible states of society from the local to the national and transnational.

The Global Commons

Nation states, thus dis-enclosed, have become, happily, more open to critical interpretation, and international observation, arguably one of the most powerful results of networked space for national governments during the last decade and a half. Legal definitions of citizenship, property, and so forth, when inside this transnational space, becomes blurred much as the film, *The Terminal* (2004), portrays in the figure, played by Tom Hanks, who is imprisoned inside and airport because he has no country. Because of networks, a multi-'global commons' is also possible. This global commons puts into flow, the transnational spaces of all participants. Internet list serve--empyre, faces, fibreculture, nettime, undercurrents, the blogosphere, and social

networking sites, each with global readership and membership; the proliferation of RSS feeds and aggregators for sorting web content, have developed into a non geographically specific, multi 'global commons', organized around networked relationships. This is the transnational space of flows in which, arguably, identity construction is part of the social fabric of multivalent use. In this context, transnational means to have a location and simultaneously to be able to imagine worlds without borders and to communicate with others on that basis; to make one's communications over borders, without borders. It is de-centered space, where the idea of 'center' is challenged and unexpected. The World Summit on the Information Society (WSIS) extends the global commons as a civil body of members with roles in shaping the 'global commons' and the Internet. This is a materialization of the transnational imagination as a civil society. Smith's positioning of a 'transnational urban identity' recognizes the particulars of transcendent social conditions wherein identity from several places at once emerges. The possibility of these new forms of identity and exchange can sometimes be threatening to those invested in certain concepts of enclosure. One example would be the flagrant nationalism and centralized economic power invested in by the Recording Industry of America, which has sought to arrest and fine persons in numerous other countries for downloading mp3s of copyrighted music. Enclosed thinking, demonstrated thus by the RIA, is a legal myopia produced by an excess of imagined enclosure. Privatization as such is an attempt not only to restrict the instantaneous reproducibility of data, but the potentials for distributed creativity it brings with it --- a borderless, boundary-less condition without tangible limits. Melvyn Webber argued of the landline telephone's effect upon American urban professionals that non-geographically specific communities created by long distance telephony formed a new urban 'non place'. Michel Augé (2000) theorized 'non place' as a function of the hyper or super modernity; the a temporal spaces found in airports and similarly "absent" and non-cultural designs for places frequented by the placeless traveler, global, temporary or not. Webber has observed that non-place based urban space changed the geographical form of the economy and of exchange while resulting in a destabilization of and redistribution of older forms of communication such as face-to-face. As rapid, mobile personal communications have become more distributed and effective, debates about the containment of

information have become more vociferous. Both the Record Industry of America's pursuit of illegal downloading and the jailing of Pirate Bay members by entertainment industry-backed prosecutors, underscored the shortsighted sense of enclosure dominating Big Business. Billboards for spy ware along Market Street, the main commercial street of San Francisco, depict networks full of rats. (Notes and observations of the author). These advertisements are commercial efforts, it would appear, to enclose what has become *dis-enclosed* through hybridization of digital media and wireless communications and raise even greater issues regarding, not only enclosure of data but enclosed bodies and the right to privacy and the effects of changing modes of social discourse with respect to certain locations and their surveillance. Networks full of rats throw suspicion upon networks as a social place after the War on Terror. Moreover, where cell phones can and cannot be used for social reasons, or for technical reasons, or where the intervention of the functionality of the phone, in terms of its having a camera, suggest new social landscapes of fear, suspicion, non acceptance and denial, mitigated by lack of interest and tolerance. While fear of phone camera use in bathrooms, for instance, has created no phone zones, other public uses of phones, such as carrying on loud, personal conversations in public, bear a less explosive response. It is clear that the absorption of cell phones into public space, and their attendant social issues, from listening in to being videoed, to using videos in legal cases, has taken place after a decade or more of immersion in social adjustment to the ubiquity and borderlessness of trans spatial, co present mobile identity.

Conclusions

At the root of complex social space, is the desire to locate one's identity within time, culture, history and community. Deleuze's dividual offers perspective on the state of identity in a wireless society. The dividual shows how selfhood both shifts and is resilient. Dividuation lies beneath most mobile and wireless identities, including the cyborg and transnational figures. The cyber and networked relation of self/community demonstrates how it is that wireless identity transforms. These perspectives provide a speculative framework from which to explore urban

identity.

That said, exposition of the non-technological body is not an argument for a more "real" or "natural" state of being. Without acknowledgement of human activity outside that of technological interfacing, all cultural memory of 'off time', of time without computing, machines, or screens would be lost. Non-technological spatio temporality must weave into an analysis of networked urban space and our mobile use patterns even though mobility appears to equate with seamless connectivity. The non-technological of human communications exists alongside technological experience, therefore is critical. The alleged "neutrality" of mono culturalism is a position with respect to diversity and inflects, even in Mitchell's cyborg, as without exposure or influence of other mediations. His cyborg life is wireless. There is no presence of the urban complexity other than his networked individualism. The city is absent.

Delay in communications, and the a synchronicity and even 'interference' associated with it, offers much with which to understand how pervasive wirelessness, its variability and the fluctuations of inadequate or unequal contexts for technological use, affect face to face and other communicative social forms. In this context, how wirelessness creates or stimulates notions of self with networked mobility, ties in to urban form, planning and infrastructure, is crucial. Wireless identity should influence the design of architecture and cities, where community identity and need for technology is concerned. With the intersection of wireless and urban social context, notions of global selfhood are reintroduced to urban space in the context of transnationalism, and are woven into the fabric of cities of the future.

CONCLUSIONS

In drawing conclusions from this body of research, some general statements need making about mobile communications and the research. I have observed that a) pervasive cultural differences exist within mobile communications; their representation and networks and b) that specific attributes of mobile media make it necessary to evaluate concepts of 'public', 'civic', 'local' and

'community' as part of a newly reconfigured urban space upon which these technologies are making their mark. Thirdly, case study and case study analysis of urban activism and the careers of women new media artists demonstrates that mobile communications provide particular benefits to these social groups by enabling them to communicate more effectively in the context of their work.

With respect to parallel scholarship emerging during the course of my candidature, the following can be said: Creative analysis around the interpretation and representation of cities is a rapidly manifesting discourse and an effective response to the cyber culture and new technologies in spaces and economies of globalized metropolitan areas. This resurgence of interest in cities emerges after an era of globalization and the production of cities as "global entities". Moreover, it is a political response to perceived shifts in the public sector towards privatized neo-liberal economies. The discourse manifests as new architectural literature and extensive exhibitions on the making and remaking of *possible* cities. *Spectropolis* wireless festival (New York 2004) was a festival of art and community on the lawn of New York's City Hall. *Spectropolis* engaged the city's pedestrian public in wireless street art. Since then, several exhibitions have taken place on the East Coast of the United States in conjunction with research centers: the Institute for Distributed Creativity, New School for Social Research, New York University, The Architectural League, and MIT Media Lab, to name a few. These events underscore continued interest in architectural relationships between networks and the city. *Situated Technologies* (2006), a conference, *Sentient City*, an exhibition on intelligent environments (2009), and new data mapping projects from the *Senseable City Lab* at MIT (2007-9) are a few. In San Diego, Sheldon Brown created the *Scalable City (*2008) looking at algorithmic, regenerative buildings and spaces. The *Regenerate City* (www.metamute.com) featured in a recent article co-authored by Anthony Iles and Josephine Berry Slater theorizes spaces for radical art in spaces of neo-liberal urbanism. Varnelis has edited *The Infrastructural City* (2007) which chronicles Los Angeles' urban infrastructure, urban design, mythologies of place and multiple threads of urban history including mobile communications. In 2009, artists, architects, curators, and activists created, *City Centered:*

A Festival of Locative Media with Gray Area Foundation for the Arts and public broadcasting station, KQED, Conceptual Information Art Department at SFSU, and Access Now. (www.citycentered.org) City Centered involved transforming non-art storefronts into installations and engaging the social milieu of San Francisco's downbeat Tenderloin District in wireless art for two days. These scholarly and creative interpretations of wireless and networked cities offer challenging perspectives on the transforming city in today's technological reality. They suggest ways to continue to design, evaluate, engage, and interpret cities as ubiquitous computing establishes itself. Wireless technologies have already begun to contribute meanings, questions, and a poetics of space to a variety of urban experiences, from architecture to urban history to transit.

Finally, mobile media culture varies greatly as a subjective experience of desire from place to place, person to person, network to network and city to city. The construction of both individual desire and of shared social space in conjunction with the urban planning and military interests behind American cities produces wireless culture that is unique. Wireless technologies mimic tendencies in older technologies, including those of personal computers, landline telephony, word-of-mouth, Victorian calling cards, travel postcards and hand held video camcorders. Set within larger contexts of building and information systems, networks and powerful satellite driven surveillance technologies, wireless media has the power to affect and transform larger and larger sections of cities as well as the localized place making within them. Important to understanding where we are today with respect to mobile communications is the history of emergent technologies, the specter of '

'divides' brought about by them and the socioeconomic order of cities, as well as the power of the marketplace. These cultural forces influence the comprehension of, use of, purchase of, and expectation of populations with respect to technologies. Moreover, the newness which mobile media offers may simply obscure cultural inequities.

Prophetic Critical Wisdom

Nearly two decades ago, wearable inventor Steve Mann declared personal wearable computers

and civilian cyborg lifestyle to be the future state of sociability and the technological antidote to imbalances in the techno culture. (Mann 1996) His research evaluates deep social experiences of daily activities experienced while utilizing his inventions, including engagement with his wife over household shopping or lecturing to students. (Mann 2007) In the process, Mann has become the wearer/cyborg, tailoring technologies to meet the latest developments and as an armature of minute parts capable of discreet worn on the body application. What previously had had an industrial 'off the shelf' aesthetic, replete with wired, webcam-mounted hardhat, developed more recently into a single pair of subtly augmented sunglasses and a wireless hand controller. This nearly invisible apparatus signals a pivotal moment in the history of computing. So small and so powerful is the computer component of today that it is nearly invisible, capable of melding into the body and the environment. Mann did not do this alone. Indeed, the move toward 'smartness', nanotech, ubicomp, sentient space and other immersive, intelligent environments is the result of numerous research initiatives in many countries. Nevertheless, Steve Mann, Mark Weiser and others have created commentary on technological disequilibrium suggested by smart technologies. For whom do these dream concepts exist?

Mobile City

The "mobile city" is a phenomenon only recently considered in terms of today's wireless. It was, however, predicted by experimental architects in the 1960s and 70s, as I have shown in Chapter 2, and which Rowan Wilken elaborated on in his 2006 Fibreculture article, 'From Stabilitas Loci to Mobilitas Loci: Networked Mobility and the Transformation of Place.' The mobile city exists now at present largely in terms of cacophonous competition among commercial *wireless* networks, cellular and wireless broadband, and scant few community-based LANs. Free public Wi-Fi for all, in the United States is usually found in smaller municipalities, specific buildings and networks of buildings under the rubric of 'municipal wireless.' Thus, the 'wireless city' (if cellular technology is eliminated and San Francisco is used as a model) remains a fragmented and inconsistent enterprise. This unevenness emerges for a variety of reasons--financial, social, and political---but manifests generally because of inadequate policymaking in city government. On

another level, however, “wireless cities” are an identifiable commodity drawing huge sums of international investment. Twenty Mexican cities are simultaneously scheduled for WiMAX. (Dow Jones & Company, 2009)

As the burgeoning landscape of wireless technologies and cities becomes refined, critical culture has begun to examine urban history, histories of mobility, and the deployment of these ideas with respect to ubiquitous mobility and urban identity. Alev Cinar and Thomas Bender, writing on urban imaginaries, critique histories emphasizing “the city” as a singularity (Cinar and Bender 2007, xv-xvii) suggesting, instead, that there are ‘competing narratives’ (2007, xiv), multiple histories, interpretations and readings of urban space, all of them powerful in the construction of cultural diversity on which healthy cities grow. Today’s urban space requires a politics of difference and interpretation, precisely because of new technologies. Decentralized and distributed mobile communications, with their small size and connection to telephony, may well mean, as it has in the past, more vigorous growth from within previously marginalized, even invisible urban areas. Cities in parts of Asia and India have boomed into ‘mega urbanization’ where there is also high concentration of mobile phones. The cell phone is a popular and essential tool, taking over where landlines have never taken root. Economic shifts in the place and content of production based on patterns of mobile use may change growth patterns as a result.

Urban Design

In the late twentieth, early twenty-first, century, with its decades of fortressing, gated and planned communities; cities are designed and even manufactured on new terms. Older economies exist under very different circumstances from new urban arenas of global tourism, malls and digital production. The design of interiors, the disappearance of parking meters, and changes in lighting and the function of public spaces may well be part of the trend towards cities based on perceived economic “restructuring”: the mobile workforce and the flexible lifestyle. Thus, a multiple histories/narrative approach, like that of Cinar and Bender’s book, which recognizes the *possible* cities within cities and which includes older struggling economies, and immigrant communities may assist us to understand how today’s cities work.

If multiple interpretations of technological mediation and cities are the concern, then critical perspective must offered on the roles and place of *women*. There has yet to be enough research conducted around wireless technologies and women in the United States or scholarship which takes into account how women feel about the use and design of mobile technologies, how they perceive of themselves within the techno culture, their health with respect to mobile technologies and other preoccupations. To some extent, our relationships to cell phones condition our occupations. A child carer and a female lawyer, compared in terms of their experience of mobility, might be completely different in how they see the use of their phones. Much gender research has focused on digital divides which place women from affluent backgrounds simply into the class of 'haves' and which exclude class analysis of ownership. Income differentials and questions of depleted employment in the flexible workforce attach to some of the concerns that Gregg has had about myths of flexibility. Despite numbers telling scholars that we are catching up in terms of ownership, real understanding of female us is, arguably, still about the technology and its perceived usability. Young women have been born into the eras of the Internet and the mobile phone. They move through what were at one time male-dominated careers, such as medicine and architecture, with greater swiftness and success than their counterparts of thirty years ago. Studies do not seem to reflect these sorts of generational differences. Reports on digital inclusion from 2007, written about earlier in the thesis, did not break down categories of use and ownership based on any factor of gender, except to comment briefly about boys and girls and games. Is this a post-feminist position about women and technological participation, or at least a disavowal that gender plays any role at all in the technological landscape between participants? Studies examined in the context of this thesis show that populations and cultures differ widely with respect to how the category of gender' functions as a social construction. Lemish and Cohen (2004 in Castells 2007) suggest that social constructions of gender are ingrained in research culture and that the challenge to study gendered use begins with the design of studies themselves. A conclusion can thus be drawn that studies need to be designed which address gender as a developed and complex category and which focus specifically upon new technologies, such as all forms of wireless. Attempts have been made to understand the relationship of professional women

artists to mobile technologies. These women, viewed as a group, had achieved self-actualization vis a vis technology and in terms of representing themselves and their gender, and had fully independent and satisfying *mobile* careers. This offsets the presentation of career mobility in advertisements and expands notions of possible creative mobile lifestyles. While women play central roles as social networkers in much mobile advertising, there may be wider gaps in identity-making practices based on gender that are yet to be seen. A resurgence of these conventional, cliché portraits of female mobility may, in fact, work to re-entrench marginal and less productive roles for women across society.

New Research Directions

New research directions for this work lie in three areas. One, continued work on urban history, urban geography and urban design. Two, continued work on women and technology and, three, continued work on the design of wearables for purposes of creative media and everyday life. A curious essay by Margaret Cohen entitled, 'Modernity on the Waterfront: The Case of Haussmann's Paris' (Civar and Bender 2007: 55-78) explicitly describes Paris in terms of the role and representation of the Seine in the city from periods before Haussmann's renovation to the period after the redesign. Cohen outlines both the architectural changes Haussmann's work incurred, such as the building of picturesque new bridges over the water, as well as compromised daily routines and engagements that inhabitants familiar with the river underwent for instance, the ritual of housemaids washing up bedclothes at its banks. This analysis presents a fabulous urban analysis bypassing customary considerations of the modern city and pointing, instead, towards time and custom-based readings of urban activity while, at the same time, making visible architectural transformations as a result of major urban redevelopment. Fletcher studio architects in San Francisco have recently undertaken analysis of the man-made Los Angeles River infrastructure. (Fletcher in Varnelis 2009) In the study, Fletcher examines detailed data on the geographic region immediately surrounding the river; explores natural and man made water sources feeding the river; photographs the river empty and full, overgrown and barren; and borrows stills from cinematic representations and creates designs for the ongoing use and presence of the river in the future city. These scholarly analyses of place evolving from specific

architectural readings of powerful and often overlooked urban elements; eloquently express the complexities of urbanism as it engages us everyday. Such studies could take place with respect to the growing presence of wireless infrastructure towers, antennae, trees, and other instruments as they penetrate the urban and suburban landscape. The methodologies offered contribute much as a means for understanding and writing about the influx of technologies on populations and spaces as we now know them. New research in this area would entail examination that is more specific and interpretation of urban spaces as they are enabled over time, as well as a more theoretical evaluation of DIY wireless utopia. What could the wireless city be? Of particular interest to the study of cities is GIS and its use in urban design and the development of new geographies. San Francisco State University has a research institute for GIS. A goal of this research would be to create detailed maps or articulate how mapped information informs disciplines. Further research on the design of networked and online cities as a chronology and set of examples of cities could help to explore the role of communications technologies in relation to specific planning concepts of the past, present and future. This work would be useful for generating additional ideas about mobility as a new form of urbanization and industrialization, in the post-industrial urb.

Gender Research

New directions for research on gender and mobile culture might investigate female cultural imagination of wireless. How do mobile women describe their mobility? This would require additional reflection upon global new media list serves, how they might inform women and their mobility, our understanding of body and machine; histories of communications and wireless tools, the circulation of information among women; and techno cultural imagination of gender and its construction. What social games are at play with these intimate technologies? Can their subjectivity be described? This work could undergo study of interiority, miniaturization and wireless imaginations of self/other in the co-present context of intimacy. Likewise, it might be useful to explore subjectivity of women artists around transnational networks and identity. Urban immigrant women frequently learning technological skills are responsible, in many border circumstances, for small business or 'suitcase/shuttle trade' and the interweaving of cultures in liminal zones. (Yukseker, 2007, 17-36) Working with these women to foster and support the use

of technology would be an excellent area of ongoing research. Another paper I would like to work on would be about gadgets for children and the study of gender. Wireless "girl" technology is coming to the consumer as beauty and fashion makeover sets, portable diaries, and social networking tools encased in pink plastic amidst narratives of stardom and magic. Boys command cities, outer space and seaports as captains and pilots. They identify with adventurers and heroes. Nintendo DS appeals to boys and girls in case colors and game design. From battle games for boys to pets, baby care and gardening moms for girls, the DS (now DSi) is marketed to both genders and to their parent's perceptions of gender. Contemporary gender roles are embedded among our children's toys and video games. Finally, learning how women fare in technologically based professions versus how they perceive themselves to use or create with technology would help to understand how technological design can better accommodate females. Studies of communication and occupation could be researched around labor and expenses of utilizing one's phone for self-marketing v. how much income is actually derived; or similar means for analyzing the application of the mobile phone to personal economic needs. Richer significance for mobile culture derives from looking at the networks people feel they need economically or socially, or would like to make, and how they organize these communities.

Finally, as cities reorganize spatially around wireless more research could be done around the development of autonomous mobile communications tools, networks and applications. As cities meld into regional urban tracts, often containing large numbers of very poor people and manifesting in changed boundaries, changed arrangements of belonging, new identifications, languages, and trade, networks of resistance, human rights, and other forms of necessary activism will emerge. These zones of transition between urban locations, some enormous and teetering on the brink of collapse, some minor and habitual, fragmented and local, become negotiable partly through mobile tools. New directions for research in this area might emerge around the study of diversity in places of recent migration, transient labor, zones of transit and precarious or modified borders. Like the Transborder Tool project, this research might entail looking at how mobile tools and social media can be designed to create interfaces, identity markers, navigational tools and co presence which is ultra low cost for communities of interest in these zones. In addition,

Twitter is unusually powerful as an informational and creative social media platform. In the period following Michael Jackson's death (June 2009) Twitter's user graph was unprecedented in network usage. New research conducted on and with Twitter and social media, around their use in media storytelling, news and community participation and identification can be designed to understand the medium and how people are using it. Participation in Twitter creative projects or in the context of DIY media might also be a worthwhile direction.

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APPENDIX

Glossary of Terms

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Cell phone (CELLular telePHONE) The first ubiquitous wireless telephone. Originally, analog, all new cellular systems are digital, which has enabled the cell phone to turn into a handheld personal computer.

Introduced in the mid-1980s, cell phone sales exploded worldwide in the 1990s. By 2008, there were more than three billion in use, and many users have become addicted. A cell phone is also called a "mobile phone" or "mobile," especially outside the U.S.

•Major Carriers

In the U.S., the major cellular carriers are AT&T (formerly Cingular), Verizon Wireless (formerly Bell Atlantic Mobile and Alltel), Sprint Nextel (merger of Sprint and Nextel), T-Mobile and Virgin Mobile USA. The largest cellular company in the world is UK-based Vodafone, which includes substantial ownership in Verizon Wireless.

•Cell Technology

Geographic areas divide into a number of slightly overlapping circular "cells." Each cell contains a base station, which is identifiable by its transmitting and receiving antenna located on a tower at the top of a hill or building. The base stations connect to the landline telephone system of the country.

The multiple cells combined with low power transmitters allow reuse of the same frequencies with different conversations in different cells within the same city or locale. The primary digital cell phone technologies are TDMA, CDMA and GSM. See 3G, PCS, AMPS, GSM, TDMA, CDMA, WAP, cell space, screaming cell phone and cordless phone.

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DVI DS:

Digital Video and Imagery Distribution System

Above definition from:

http://www.mariosalexandrou.com/definition/wimax.asp

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GIS Geographic Information Systems (GIS)

GIS is a system of hardware and software used for storage, retrieval, mapping, and analysis of geographic data. Practitioners also regard the total GIS as including the operating personnel and the data that go into the system. Spatial features are stored in a coordinate system (latitude/longitude, state plane, UTM, etc.), which references a particular place on the earth. Descriptive attributes in tabular form are associated with spatial features. Spatial data and associated attributes in the same coordinate system are then layered together for mapping and analysis. GIS is used for scientific investigations, resource management, and development planning.

GIS differs from CAD and other graphical computer applications in that all spatial data is geographically referenced to a map projection in an earth coordinate system. For the most part, spatial data can be "re-projected" from one coordinate system into another, thus data from various sources can be brought together into a common database and integrated using GIS software. Boundaries of spatial features should "register" or align properly when re-projected into the same coordinate system. Another property of a GIS database is that it has "topology," which defines the spatial relationships between features. The fundamental components of spatial data in a GIS are points, lines (arcs), and polygons. When topological relationships exist, you can perform analyses, such as modeling the flow through connecting lines in a network, combining adjacent polygons that have similar characteristics, and overlaying geographic features.

Above definition from http://www.nwgis.com/gisdefn.htm

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GPS Global Positioning System is a radio navigation system that allows land, sea, and airborne users to determine their exact location, velocity, and time 24 hours a day, in all weather

conditions, anywhere in the world. The capabilities of today's system render other well-known navigation and positioning technologies, namely the magnetic compass, the sextant, the chronometer, and radio-based devices, impractical and obsolete. GPS is used to support a broad range of military, commercial, and consumer applications.

24 GPS satellites (21 active, 3 spare) are in orbit at 10,600 miles above the earth. The satellites are spaced so that from any point on earth, four satellites will be above the horizon. Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock, the satellite continually broadcasts its changing position and time. (Once a day, each satellite checks its own sense of time and position with a ground station and makes any minor correction.) On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within a few meters.

If the receiver is also equipped with a display screen that shows a map, the position is shown on the map. If a fourth satellite is received, the receiver/computer can figure out the altitude as well as the geographic position. If you are moving, your receiver may also be able to calculate your speed and direction of travel and give you estimated times of arrival to specified destinations. Some specialized GPS receivers can also store data for use in Geographic Information Systems (GIS) and map making.

Above definition from:

http://www.gis2gps.com/GPS/GPSDEF/gpsdef.html

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G3 (3rd Generation) The current generation of cellular transmission, which primarily features higher speeds for Internet access and real-time video. In the U.S., the major 3G technologies are EV-DO for CDMA networks, such as used by Verizon and Sprint, and HSDPA for GSM networks for carriers such as AT&T and T-Mobile. For example, the iPhone 3G, Apple's second-

generation iPhone, uses HSDPA, a 3G technology. For more details, see cellular generations and iPhone.

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G4 (4th Generation) The latest wireless wide area network (WWAN) technology. Designed to increase data transfer speeds for Web surfing and video, there are two major 4G technologies: WiMAX and LTE. See cellular generations, 3G, WiMAX and LTE.

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Fiber optic

Refers to systems that use optical fibers. Fiber- optic communications networks have transformed the world. Barely starting in the late 1960s but gaining serious momentum in the 1980s, the phone companies began to replace their copper long distance trunks with fiber cable. Eventually, all transmission systems and networks are expected to become fiber based, even to the home. In time, the electronic circuits in computers may be partially or fully replaced with circuits of light, in which case fiber pathways would be used throughout the system. Definition of: optical fiber A thin glass strand designed for light transmission. A single hair-thin fiber is capable of transmitting trillions of bits per second. In addition to their huge transmission capacity, optical fibers offer many advantages over electricity and copper wire. Light pulses are not affected by random radiation in the environment, and their error rate is significantly lower. Fibers allow longer distances to be spanned before the signal has to be regenerated by expensive "repeaters." Fibers are more secure, because taps in the line can be detected, and lastly, fiber installation is streamlined due to their dramatically lower weight and smaller size compared to copper cables.

•Starting in the 1970s

In the late 1970s and early 1980s, telephone companies began to use fibers extensively to rebuild their communications infrastructure. According to KMI Corporation, specialists in fiber optic market research, by the end of 1990 there were approximately eight million miles of fiber laid in the U.S. (this is miles of fiber, not miles of cable which can contain many fibers). By the end of 2000, there were 80 million miles in the U.S. and 225 million worldwide. Copper cable is

increasingly being replaced with fibers for LAN backbones as well, and this usage is expected to increase substantially.

•Pure Glass

An optical fiber is constructed of a transparent core made of nearly pure silicon dioxide (SiO2), through which the light travels. A cladding layer that reflects light, guiding the light along the core, surrounds the core. A plastic coating covers the cladding to protect the glass surface. Cables also include fibers of Kevlar and/or steel wires for strength and an outer sheath of plastic or Teflon for protection.

•Enormous Bandwidth

For glass fibers, there are two "optical windows" where the fiber is most transparent and efficient. The centers of these windows are 1300 nm and 1550 nm, providing approximately 18,000 GHz and 12,000 GHz respectively, for 30,000 GHz. This enormous bandwidth is potentially usable in one fiber. The only limitation is the electronic circuits that modulate the light waves to represent the data. Electronic circuits have yet to come close to the frequencies of light. Plastic is also used for short-distance fiber runs, and their transparent windows are typically 650 nm and in the 750-900 nm range.

•Single mode and Multimode

There are two primary types of fiber. For intercity cabling and highest speed, single mode fiber with a core diameter of less than 10 microns is used. Multimode fiber is very common for short distances and has a core diameter from 50 to 100 microns. See laser, WDM, fiber optics glossary and cable categories.

Above definitions from http://www.pcmag.com/encyclopedia_term

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Wi-Fi A wireless local area network (WLAN) technology that conforms to the IEEE 802.11 standard. Wi-Fi is the wireless counterpart to the wired Ethernet network, which is the ubiquitous local area network (LAN) technology used in companies and homes worldwide. A Wi-Fi logo

from the Wi-Fi Alliance certifies that network devices comply with the IEEE 802.11 standards. In the early 2000s, 802.11b became widely used, followed by 11a and 11g. The latest version is 11n (see 802.11n). Within a short time, all laptops and many handhelds came with Wi-Fi built in. Earlier laptops can be Wi-Fi enabled by plugging in a Wi-Fi adapter via a PC Card or the USB port. To learn how Wi-Fi fits into a home or office network, see wireless LAN and Wi-Fi hotspot. Wi-Fi sounds a lot like "hi-fi," thus it is mistaken to stand for "wireless fidelity." Although the term was inspired by "high-fidelity," Wi-Fi is officially just a catchy name. For details about the transmission technology, see 802.11. See Wi-Fi Direct, WiMAX, Wi-Fi Multimedia, Muni Wi-Fi, wireless mesh network and cellular vs. Wi-Fi.

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WiMAX

Worldwide Interoperability for Microwave Access (WIMAX) is a communications technology that uses radio spectrum to transmit tens of megabits per second in bandwidth between digital devices. Similar to Wi-Fi, WiMAX brings with it the ability to transmit over far greater distances and to handle much more data.

WiMAX was developed by equipment manufacturers, service providers, and software companies around the world all of who were motivated to ensure that equipment, regardless of who made it, would interoperate. In practice, companies such as Cingular and Verizon will likely make WiMAX available to consumers. These companies have purchased the necessary rights to the radio spectrum and are building nationwide networks.

WiMAX will coexist as a radio capability on the mobile computer, along with other radio technologies such as wireless fidelity and third-generation (3G), for many years.

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Wireless Broadband

High-speed wireless transmission of data. However, the "high" in high-speed is always a changing number. In the past, wireless broadband started at 250 Kbps for cellular carriers, whereas land-based broadband started at 1.5 Mbps (T1 rates). Subsequent 3G wireless systems have exceeded T1 rates, and wirelesses LANs (Wi-Fi) have long passed that benchmark. In any

event, wireless systems are a little to a lot slower than land-based, wire line networks. For example, high-speed, wired LANs have reached 10 Gbps.

•Wireless Local and Wireless Wide Area

Wireless broadband falls into local and wide area categories. Wireless local area networks (WLANs), namely 802.11 Wi-Fi networks, transmit at high-speed, but Wi-Fi coverage areas (hotspots) are sporadic and span only a couple hundred feet. In contrast, wireless wide area networks (WWANs), provided by the cellular industry's EDGE and 3G (EV-DO and HSPA) technologies, are much slower. However, cell towers span several miles and provide contiguous data service just as they do voice. See 802.11, 802.16, cellular generations and broadband.

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