**Public Space Redux: The Technologizing of Public Space**

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  There was a time, not so long ago, give or take a couple of thousand years, when our vision of place, coincided with our ability to walk that distance within a day. The polis of ancient Athens was a very small community probably consisting of between five hundred and a thousand citizens. It was a community of awareness, of being conscious of the other. The ancient polis was a political and social entity, a place of social interaction.

 Somewhere along the road of progress we learned that we could extend our political and social being through the messenger and the message, that we could increase the scope of place, but that the concept of place was no longer defined by the limits of locomotion, but rather by the speed of transmission. The polis grew. The village became a town. The town became a city. The city became a megalopolis. The megalopolis became a global entity.

 The impact of technology has begun to receive some attention typically associated with the blurring line between private communication in public space. Some argued technologies were isolating people and drawing them out of public spaces. More recently, research by Keith Hampton has garnered notice by exploring whether a connected digital world would diminish interaction in public space. His research comparing the films of Holly White “Street Life Project” and the work of Project for Public Spaces with contemporary films of the same public spaces found that public spaces in the last 30 years were not more isolated, lonely places filled by those distracted by digital devices (Openheimer, 2014).

 Yet, modern life is lived in the interstice between physical and mediated spaces (between physical local and virtual connection) the relationship to public space. Media theorist Marshall McLuhan observed, “All media work us over completely. They are so pervasive in their personal, political, economic, aesthetic, psychological, moral, ethical, and social consequences that they leave no part of us untouched, unaffected, unaltered” (McLuhan & Fiore, 1967, p. 26). Yet those concerned with public places and spaces from diverse fields have neglected the powerful media component of placemaking and place experience. This has been reflected in a noticeable disconnection of place from communication behavior and the detachment of technology from place and behavior. This paper investigates the impact of communication technology on public places, public spaces.

**Media Matters**

 Media are conceived of as technology that co-constitutes the experience of the city providing, as Scott McGuire in *Media City* (2008) suggests, new frames for making sense of the city. Location-aware technology makes it possible to simultaneously locate oneself and be networked within city spaces. Mobile phones, GPS receivers, and RFID tags are examples of location-aware mobile technologies that mediate our interactions and influence how we experience and move in these spaces. Privacy and surveillance issues proliferate. Urban space is being redefined and conceptualized with the addition of mobile gaming, locative social media; and the acceleration of “intelligent” infrastructures. New mapping technologies have introduced VGI (volunteered geographic information) thereby empowering ordinary citizens to collect and distribute geographic information via GPS and Internet mapping resources. These media become so embedded in our everyday practice that we can’t imagine what life would be without them. Public policy has embraced this notion so cities have created new initiatives for municipal Wi-Fi and broadband and other forms of connectivity (Connected City). The New York City initiative currently transforming old payphones into wi-fi hotspots (LinkNYC Media Kit)

 Scott McQuire noted public space in the media city is experienced as relational space. Relational space can be defined by the temporary position occupied by each subject in relation to numerous others, which suggests that relational space is not easily unified since every subject belongs to multiple matrices or networks that overlap and interpenetrate The heterogeneity of relational space is a key experience of contemporary globalization, and demands new ways of thinking about how we might share space to constitute collective experience (McQuire, 2006).

 For some inexplicable reason there is lack of a bridge that links both mediated and non-mediated communication from where it occurs. In short, most models of communication exist outside the physical space of the immediate environment. The field of Human Behavior and Environment is an exception to this omission. Irwin Altman and Ervins Zube’s *Public Places and Spaces* published back in 1989make an important contribution as they it bridges place and communication. “*Space refers to the abstract geographical qualities of environments, which become transformed into meaningful places as people use, modify, or attribute symbolic value to specific settings.* (Altman and Zube, 1989, p. 2).” Although some of its contributors are aware of mediated communication, the perspective nevertheless falls short of incorporating communication technology into its sphere as does innovative Danish architect Jan Gehl who emphasized the significance of the spaces between buildings and opportunities to “meet our fellow citizens face to face and experience directly through our senses.” (Gehl, 1987). Gehl’s work supports the notion that public space functions as a medium of communication by suggesting that the three purposes of public spaces are: meeting, market and connection. However, the role of media connection in the lives of those inhabiting physical spaces is neglected.

 If the symbolic impact of place and human behavior has been recognized, place has been disconnected from communication technology. Communication technology displaces and relocates functions within a community (Gumpert and Drucker, 2004). We have argued “One is left with a strange conception of civic involvement--the informed citizen disconnected from community, connected with others without physical connection. The detached citizen resides in a place of their choosing, but in a variety of distant communities, which in turn reshape their physical spaces in paradoxical ways” (Gumpert & Drucker, 2001). This relationship can be seen in the following modification of the model of convergence.

**Mediated Interstice**

The traditional notions of pubic place and public space, confront the realities of a digital media environment in which the individual blocks, filters, monitors, scans, deletes and restricts while simultaneously constructing a controlled media environment. The ability to connect globally has the tendency of disconnecting from location. The ability to personalize creates feedback loops and media cocoons.

  An assortment of technologies enable information from the digital world to be layered onto the physical world altering the person/environment relationship by creating spaces in which users interact with their physical surroundings through digital media.

Public spaces are mediated in a variety of ways:

1. Embedded Media (infrastructure)
2. Mediated people (mobile media)
3. Internet of things (connected devices)
4. Augmented reality (layered information)

*Modeling Public Spaces in a Media Age*

In examining the different ways media change public space we can utilize a modelbased on the flow of the mobius strip is fluid enough to allow for the continuous influences of the physical environment augmented by embedded and mobile technologies and influenced by larger media environment.

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“The benefit of that model represents a process of communication and influence of channels fluid enough to allow for the continuous flow of ideas without accentuating division or separation” (Gumpert & Drucker, 1999, p.14) This model emphasizes the reciprocal influence each communication opportunity and medium has upon another. Further, this model of convergence highlights the fluid interconnections of context and technology.

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 The psychological, cultural, social, and structural connection of communication technology and urban/suburban planning has been grossly neglected. There is a reciprocal and defining interdependence of place modified by communication technology. Our experience and our perception of space is changed through our experience of mobile and wireless networks (Willis, 2008, p. 11) “Euclidian or topological understanding of space can be interpreted in terms of physical separation, bounded-ness, linkage, temporality and presence (Willis, 2008, pp. 11-12)

**Embedded Media**

Fundamental infrastructure requirements and services run the gamut from utilities such as water and energy to transportation facilities (highways, lighting, and rail systems). Increasingly important, communication infrastructures include the technological basis for electronic transmission of data. IBM’s Smarter Cities project notes “Infrastructure services make a city "livable." (Smart Cities). Companies such as Cisco and Siemens are adding information technology infrastructure to power emerging feedback systems providing information on traffic and the electrical grid. These smart-grid networks will become increasingly responsive (IBM Smarter Cities). Resilient physical infrastructures are a high priority for cities of the future (Cities for Tomorrow, 2014). The importance of the non-physical component integration in the infrastructure has been recognized (Carter, 2013). Much has been written about smart cities with experts recognizing that "Smart cities can only exist with the support of smart grids in a symbiotic way where they share electronics, telecommunications, and information technologies to leverage smart initiatives across all the other areas involved in developing a smart city" (Devoe).

 The technical necessities of such a smart communication grid generally focuses on how the communication infrastructure seen as referring to “the backbone of the communications system upon which various broadcasting and telecommunication services are operated. This can be built from copper cable, fiber, or wireless technologies utilizing the radio frequency spectrum, such as microwave and satellite. The infrastructure is the core component that connects upstream production, such as voice, data and audiovisual services, with downstream consumers” (Gillwald, 2008).The social/community implications are often neglected. That is not to suggest the social elements are ignored. Critics argue societies “should seek out opportunities to bridge these physical and nonphysical infrastructures through, for example, social practices that build community cohesion and draw attention to [multifunctional places](http://openstreetsproject.org/)” (Carter, 2013). Mobile ubiquitous computing and other devices require embedded urban infrastructures.

 “Since 2009,within this paradigm of urban development and planning, a new round of technologies has appeared related to smart systems, embedded devices, sensor networks, and real-world user interfaces” (Komninos, 2014, p. 63). Companies in the ICT sector such as CISCO, Microsoft, Accenture and IBM have been at the forefront of adding these devices to the city planning equation (Komninos, 2014). Mark Shepard explored the potential of these embedded technologies in

 Embedded technologies are not only about sensors, data gathering, sensing technologies and data visualization. Some of these technologies have been associated with the quality of life in cities. Whether for branding a city or enhanced experiences, municipal broadband. Cities like Barcelona have jumped on the bandwagon to use Wi-Fi and location based technologies to “create new connections between people, process, data, and things” (Connected City). Examples of this type of infrastructural change are too numerous to mention but one specific project of interest is LinkNYC. Refitting obsolete public payphones, a not-for-profit consortium of four companies known as CityBridge will install a new internet infrastructure in the sites of old payphones. Kiosks called [Links](http://www.link.nyc/) will provide fast free and will also have USB ports for charging. Each link will provide Wi-Fi access for devices within a 150-foot radius. Users may make telephone calls free calls to anywhere in the United States. The kiosks will feature built-in Android tablets for connectivity for those without a device so that the homeless can be aided as well. It is anticipated that there will be 4550 Links installed in the five boroughs within the first four years and serving as a revenue stream for CityBridge through advertising (LinkNYC Media Kit).

 The expectation of constant connection is now being associated with quality of life in cities. Embedded engineering plays a key role in the very technological infrastructure of cities that are changing everyday city life.

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**Mediated people/Mobile Media**

Media rich public spaces create a new type of public space offering the potential of broadening use and participation. Mobile devices have ushered media consumption into public space including iconic public spaces, augmented by ubiquitous/pervasive mobile computing and wireless connectivity which means that physical urban space is augmented and digital (Aurigi and De Cindio 2008). Many entering public spaces venture forth armed with a mix of old and new communication media. The public spaces of media cities are environments in which embedded technologies are present in the environment (e.g. big screens, building skins, CCTV etc.), augmented with the introduction of mobile media (e.g. mobile phones, GPS, e-books, handheld games, laptops/netbooks, PDAs, even old fashioned portable radios, books, and newspapers etc.). I-phones, I-pads, I-pods….now “I-squares” As users enter public space deploying digital devices empowered to document, broadcast and share.

Some have argued that mobile media are taken-for-granted by users in public spaces (Ling 2012). Diverse uses have been documented ranging from perpetual contact to micro-coordination to situated documentaries. (Katz & Aakhus, 2002). Some mobile media user-generated content was created in public spaces to help others in the area. Some mobile media users took photos and videos, provided locations and shared their experiences on their social networking sites Ling, R. (2012). In *Taken for grantedness: The embedding of mobile communication into society* Rich Ling, a professor at the IT University of Copenhagen, has dealt with embeddedness relying less on implanted technologies and more on how the expectation of availability has become embedded in society and changed our interpersonal relationships (Ling, 2012).

 To understand physical space we must appreciate that communication media are powerful agents of change of an environment filled with electronic and visual information. These media filled spaces are experientially different physical environments. The introduction of media into physical public spaces brings with it remarkable change in our experience of space. (Willis, 2008, p. 11).

The accelerating ascendency of portable, mobile, miniaturized communication technology has liberated us from the confines of private space now that access is possible, perhaps expected, in public places. The figures are impressive:

* By 2015, there were over 7 billion mobile cellular subscriptions worldwide corresponding to a penetration rate of 97% (ICT Facts & Figures 2015).
* According to the International Telecommunication Union, the ubiquity of ICTs is moving well beyond developed nations 3.6 billion subscriptions are in the Asia-Pacific region where mobile-cellular subscriptions will account for 78 per cent of the world’s total (ITU releases 2014).
* By 2013, 63% of adult cell owners in the U.S. use their phones to go online. 34% of cell internet users go online mostly using their phones, and not using some other device such as a desktop or laptop computer (Mitchell, and Rosenstiel 2015).
* It is projected that mobile will help to push internet penetration beyond 50% of the world’s population during mid to late 2016 (Kemp 2015).
* It is expected that social media penetration will reach one-third of the world’s population by the end of 2015 with new users in developing nations accounting for much of this growth (Kemp 2015).

 Keith Hampton sought to explore the technologizing of pubic space in a study in which he compared archival footage from the 1970s and 1980s compiled by William “Holly” White and Project for Public Space to contemporary films of the same locations. He found less mobile media use in those space than might have been anticipated. However, Hampton asserts:

As much as we use trees and water and other amenities to encourage people to spend time in spaces, to provide them with privacy, and to facilitate group interaction, we need to start thinking about how we can use another infrastructure. Just as we would provide water fountains, food, or other amenities, we have to think about how the infrastructure of these technologies fits into public spaces. Power outlets, the sizes of tables to accommodate different types of uses, seating arrangements that encourage different types of interaction – on and offline,” all while acknowledging that despite the perceived isolation, attracting these people is equally as important to create activity in public space (Project for Public Spaces, 2014).

 An individual’s state of consciousness can be redefined through media use and in so doing; there is a remaking of the person/environment relations in urban settings. Mobile media of communication have the capacity to alter perceptions of time and place (Rettie, 2005). Diverse disciplines are exploring the impact of such mobile media use, in some cases addictions. Mobile media dependency, the shifting boundaries of public and private life with private media use in public, Media use can distribute the experience of presence between parallel interactions, creating absent presence in the face-to-face interaction, as presence is diverted to the media interaction (Rettie, 2005, p.17). Media have the capacity to reconstruct our sense of connection to things local. Presence when online or in phone space reduces presence in physical environment in which a one may be interacting with people or the physical environment which is co-present (Rettie, p.21). Gergen described this phenomenon by the term “absent presence” (2002, p. 227).



**Internet of All Things**

 Much has been written about the coming of the Internet of All Things (IoT), a term which refers to the fact that more and more "things" are being attached to the Internet. Internet of Things technology is attracting the attention of architects, city planners, and engineers. “[T[they're imagining a world with smart street lamps, smart sidewalks and even smart sewage systems (Walden 2015). Clearly the emphasis of IoT literature has been on smart devices and places. Smart cars, smart homes and smart cities have received a good deal of public attention. Certainly the possibilities are tantalizing. Smart cars can extend beyond keyless entry and smart diagnostics to smart driving features like parking assist systems to locate the nearest empty parking space and even provide prompts to help you fit into that spot (Miller, 2015, p.161). Smart homes go beyond networked security systems, controlled heating and cooling systems. The so-called conscious home can include automated tasks such as maintenance and repairs, networked sensors, and smart glass that can make blinds or shades obsolete. Smart cities have been associated with public services from transportation to utilities, waste management and surveillance (Miller, 2015,p. 264). With IoT developments smart cities will be “powered by data collected from smart devices of all shapes and sizes “(Miller 264) which will ultimately not only enhance transparency of local government but “stimulate citizens’ participation in pubic administration”(264). But we are told the “impacts of the Internet of Things on our cities don't begin and end with urban buildings — everything from the morning commute to public parks are incorporating Internet of Things technologies” (Walden 2014).

 Public spaces such as parks or sidewalks may also begin to utilize the technology to make city life easier and more efficient. According to " Jason Kelly Johnson, cofounder and design partner at Future Cities Lab, an experimental design studio, workshop and architectural think tank in San Francisco. "There's a huge potential purely for the capacity of public space to communicate all sorts of things," "Social content, political content, things related to energy consumption and the way we may be able to interlace all this stuff in an urban environment. No longer is an urban space something you design and fix in stone — it's a different way of assembling a city," he says (Walden 2015).

**Augmented Reality**

Augmented Reality (AR) provides layers of content on the landscape changing how place communicates about and how people move through place. AR can potentially revolutionize the relationship and interpretations of places. Some users create augmented content that inserts their history or challenges the history or meanings of place. (Liao and Humphreys, 2014). Some forms of AR use GPS to identify buildings then layer information pertaining to history or services available. Other technologies recognize and read the features of a place. With the help of advanced AR technology information about the surrounding real world becomes interactive and digitally interactive. AR is becoming increasingly available to the public through mobile smartphone and tablet devices.

 Location-aware mobile technologies can redefine the way people engage with public spaces raising issues of not only the person/place relationship but locational privacy issues as well (de Souza E. Silva and Frith, 2012). Location-aware technologies like maps, social networking applications and game alter the person place interaction providing information, facilitating education and historical walks, and gaming.

In light of the rise of location aware technologies in entering public space, the very concepts of space and place are being examine with regard to “location.” In *Mobile Interfaces in Public Spaces,* de Souza e Silva and Firth consider “location” to be a spot on a map with fixed geographical features but including an extra layer of dynamic meaning inscribed through location-based information (de Souza and Frith, 2012). Locations are not seen as a subset of place but sites layered with information when considering social and spatial interaction (de Souza e Silva et al, 2012, p.10).

 Some employ augmented reality (AR) technology to layer urban centers with artistic content (Karlin, 2013).“AR challenges this ownership of public space and buildings by using layers of virtual space. For example there is an app called ‘artvertising’ that allows artists to change their environments by manipulating signs and billboards” (Artvertsing). "What we really wanted to do is now put art directly onto buildings," according to BC Biermann, who founded The Heavy Projects. "Augmented reality allows us to cross private-property boundaries with street art"(Badger, 2015).

 Location-based and hybrid reality games emerged from the convergence of smartphones, GPS, the Internet, and social networks (de Souza, 2009). Net locality has been explored as an emerging form of location awareness associated with mobile phones, location-based social networks such as Foursquare and Facebook. Authors examining the opportunities for new types of interactions offered by diverse location-based games and social networking warn of the data surveillance and threats to privacy (Gordon and de Souza e Silva, 2011). Augmented reality gaming has become popular, for example Tetris, a computer game created in 1984 by a Russian computer programmer, in which a player seeks to rotate falling shapes and arrange them in horizontal rows. Contemporary Tretis game players are now playing with LED lights on skyscrapers (Matheson, 2014).

 Location aware technologies and Augmented Reality provide new intermediating interfaces between person and environment. As Keiichi Matausda, architect, designer and film-maker notes “Instead of the environment speaking to you directly, the environment speaks to the device which speaks to you.” (Myers, 2011).

**Conclusions**

 In this investigation into mediated public spaces we increasingly confront the fact that in a media era of more information, more data and more access there is more and more choice. In 1903, Georg Simmel in his essay, "The Metropolis and Mental Life," (1969) examined the aspects of city how individuals cope. The coping mechanism he discusses is the blasé attitude used by city dwellers in early 19th to 20th century who developed a psychic state to filter out and manage the overwhelming sensory stimulation of public space. This was described as a mechanism for managing personal interaction with things and people in public spaces. Simmel states this blasé attitude helps individuals deal with "rapidly changing and closely compressed contrasting stimulations of the nerves" (Simmel and Wolff, 1950, p. 414.). With so much going on in a city people learn to ignore everything that is happening around them in order to stay sane in their environment. Simmel writes, “There is perhaps no psychic phenomenon which is so unconditionally reserved to the city as the blasé outlook."(Simmel, 2010, p. 105). Simmel says:“The search for mere stimuli in themselves is the consequence of the increasing blasé attitude through which natural excitement disappears.” Writing in the 1950s Simmel describes the power of the book to divert attention. Writing in 2012 de Souza and Frith note location-aware technologies expand the forms of control and power into spaces. Consider the image of the denizen of modern public space engrossed in the interactive image on the small screen clasped in the hand, distracted or oblivious to the activities of those in corporeal proximity. The mobile devices and functionality of those devices offers endless filters buffering user from overwhelming urban environment. Absent presence may not have emerged with the mobile phone but it has certainly become an ever more technologized way to control the onslaught of urban stimuli.

 The future of places will be spaces filled with people increasingly accustomed to controlling and managing their personal “me media” environments. It is hypothesized that communicative and spatial choices that revolve around personal choice, impose new acoustical and visual dimensions on cognitive and affective dimensions of space. A “Mediated Spatial Interstice Theory” accounts for the physical environment and the media environment co-exist, define each other and refine dimensions of place identity and attachment.

 “Contemporary existence is located in the interstices (a space that intervenes between things) of physical local and virtual connection and our relationship to each is influenced by the other. Luc Lévesque has explored the  “interstitial landscape” seen as places of “otherness,” or space without “precise use”. Interstice suggests leftover space or “In a world more and more mediated and virtualized, the interstitial condition notably offers the possibility to learn from the experience of a new type of wilderness” (Lévesque, 2002).  Modern life is lived in the interstice between the physical and mediated spaces. *We have suggested a Mediated Spatial Interstice Theory*: in which the physical and media environment co-exist and define each other. There is a reciprocal relationship between physical and media spaces (Gumpert & Drucker 2012). “

 An increasing number of technologies enable information from the digital world to be layered onto the physical world altering the person/environment relationship by creating spaces in which users interact with their physical surroundings through digital media. The future of cities, simply put, has been and will continue to be influenced by media technology.

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