

## CHAPTER EIGHT

### Sensing Place: mobile and wireless technologies in urban space

*Katharine S. Willis*

#### **Introduction**

One of the primary ways we perceive the world is spatial; the physical form and appearance of our environment is fundamental to our actions and perceptions within it. However, in an increasingly mobile society with ubiquitous access to communication technologies, perceptions of space are transformed. In order to understand the consequences of this transformation it is important to first investigate the nature of our experience of space.

Through particular encounters or experiences perceptual space is differentiated into places, or sites of specific meaning or intention. These places can be created by everyday practice, such as the significance of a particular street corner on a route walked daily, or can be more ephemeral, such as a striking view once seen during a trip abroad that has endured as a memory. The experience of place manifests itself as an identification with the setting, which is referred to as a ‘sense of place’. This attribute of place is not just a perceptual response to a physical location, but also the result of an ordering and categorization of our spatial experience. As such, places reside not only in reality but also in abstract mental conceptions, which are a combination of commonly perceived and highly personalized images. These mental images of space enable us to weave together multiple, fragmented experiences into more coherent and manageable concepts, which then guide our subsequent action and perception in space. Yet we are increasingly confronted with environments that are offering new mediated forms of action and perception in space, facilitated by communications technologies. A key feature of such technologies is that they are both mobile and wireless and as such they transcend existing physical notions of space and place. In attempting to un-weave the experience of space in the increasingly mediated environments there is a need to reconsider the frameworks in which we interact and communicate in spatial settings.

In our everyday experience, cities exist as concentrated sites of encounter and interaction, but curiously communication is often not treated as part of the everyday infrastructure of urban life. This arises out of the simple fact that communications technologies are both literally and metaphorically invisible. Since cities are traditionally conceived primarily in terms of physical form and visual experience, this brings into question how we can form adequate modes of understanding and representing our interactions in urban settings. As mobile and wireless technologies proliferate in urban space it can be considered as having an existence in terms of several spaces, those of places that make up our everyday direct experience and those of the digital nodes and networks that facilitate communication. When these virtually invisible and immaterial mediated layers are overlaid and integrated within urban space, it alters both the space and the ways that people act within it. In order to investigate these emerging experiences more intricately some sites of communication technologies in the city will be studied in a

specific urban setting, and conclusions drawn about the implications for the resultant spatial experience.

### **Place and Space**

Our experience of our spatial surroundings is both dynamic and multi-faceted, and as such requires that we constantly employ methods for both recognizing and ordering that which is perceived. One of the key ways in which we order our experience of the spatial world is to ascribe meaning to the static physical setting, enabling highly individual interpretations and actions. In this manner, the individual cannot be seen as entirely distinct from the space in which they find themselves, instead their presence and action may be seen as inextricably entwined with that setting. This experience is often used to describe the nature of an attribute describe as ‘place’, where particular encounters and experiences are richly differentiated into places, or centers of personal significance (Relph 1976, 11). Perceptual space is differentiated into places or centers of special personal significance through particular encounters and experiences. This process may be abstract and highly personalized but a common characteristic is that this experience is understood as having physical form, and visual appearance (Relph, 1976, 30). Whilst places are considered as located, the mere condition of location and position is neither necessary nor a sufficient condition of place. In our everyday lives we do not experience places as distinct, clearly defined entities that can be described simply in terms of their location and appearance. Instead places occur at all levels of identity, scale and meaning; my home, the street corner, the public square, a city, even a continent, but one commonality is that places never allow simple categorization. They all overlap and assimilate with one another and are open to a variety of interpretations.

The organization of thinking, perception, and meaning is intimately related to specific places. The subjective experience of place is highlighted by the perception of whether it is experienced as an insider or outsider. As an insider, being inside is experienced as knowing where you are, where one is surrounded by a place and is part of it. These zones of belonging or identifying with a place are intensified by our intention, and therefore as our intentions vary, so the boundary between inside and outside moves or transforms. The threshold between inside and outside creates not only a boundary condition, but also the possibility of transition, a passage from inside to outsider. The experience of being an insider is characterized as a spatial identification with our surroundings manifested as a ‘sense of place.’ It is this quality of space, which is often difficult to define in precise terms, that perhaps best exemplifies both the richness of our spatial experience and also how it informs our actions and perceptions in the world.

### *Space and Identity*

In order for the perception of space to be meaningful there is a need for spatial identification with our surroundings, which is most directly manifested as an awareness of this feeling of a ‘sense of place.’ Identity is the basic feature of our experience of places which both influences and is influenced by those experiences. Indeed, the forming of identity is fundamentally a situated process; perceptions of self, identity, and memory are inextricably linked with our sense of belonging in a spatial setting. As such identity is in part a quality that exists outside of a specific time, but is a result of experience. The identity of place is a distinctiveness that persists despite changes in physical form or

appearance. This refers not only to the distinctiveness of individual places, but also to the sameness with different places (Relph, 1976, 44).

A further way in which identity of a place is understood is as a mental image or picture, a visual representation in the mind of the individual. We interpret perceptual experience of space into internal representations. The image of a place consists of all the elements associated with the experiences of individuals or groups and their intentions towards that place. Lynch established the concept of environmental image or cognitive maps of urban space (Lynch 1960, 4), and stated that for a city to be more fully experienced the imageability or intelligible elements of the city need to be understood. An imageable place is one that that can be comprehended over time as a pattern of high continuity with many distinctive parts clearly connected (Lynch 1960, 9). Indeed for most purposes the image of a place is its identity and to understand something of the content and structure of images is an essential prerequisite for understanding identity. This process of image construction is also referred to as cognitive mapping, and is a process composed of a series of psychological transformations by which an individual acquires, codes, recalls and decodes information about relative locations and attributes in a spatial environment (Downs and Stea 1973, 9). The parallel process of identity construction appears to consist of a complex and gradual ordering and evaluation of observations and expectations, a priori ideas with direct experiences, until a stable image is developed. In terms of the spatial setting this is manifest only when the place is plausible enough for the individual to be able to assimilate an enduring mental image.

### **Mediated Space**

The essentially physical view of space has always deeply influenced all forms of spatial analysis. We identify with space as having visual appearance and physical form, whether this exists in the perceptual present or cognitively as a representation. However as our experience of the world is increasingly mediated by communications technologies our relation to place and to place-bound identities becomes fundamentally changed (Carter et al. 1993, 323). One critical characteristic of these technologies is that the technology itself ceases to be the focus of the activity and instead vanishes into the background so that the focus is instead on the activity itself and the environment in which it is occurring; a form of computing referred to as ‘ubiquitous.’ The emergence of such ubiquitous technologies has enabled communications technologies to escape from the traditional physical confines of built space, since they can be both embedded and mobile. Consequently ubiquitous computers reside in the human world and they weave themselves into the fabric of everyday life (Weiser 1994, 94).

Mobile and wireless technologies are a form of ubiquitous computing that create numerous opportunities for communicating in multiple and varied locations without the requirement for a wired connection. Such technologies include mobile telephones and portable PDA’s<sup>1</sup>, short-range transmission technologies such as Bluetooth<sup>2</sup>, and RFID<sup>3</sup>,

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<sup>1</sup> PDA is an abbreviation for Personal Digital Assistant.

<sup>2</sup> Bluetooth is a reference to digital transmission on short range radio frequencies.

<sup>3</sup> RFID is an abbreviation for Radio Frequency Identification.

positioning information delivered via satellite to GPS<sup>4</sup> devices and last but by no means least WiFi<sup>5</sup> enabling wireless internet access. All of these have been proliferating and have over the last decade become common means of enabling communication. As such technologies move out of structured and enclosed physical environments, their interaction with the physical world reconfigures established structures of spatial identification in physical environments. Simply put, physically bounded spaces are less significant when information is able to pass through walls and simultaneously travel great distances. As a result, where one is has less and less to do with what one knows and experiences. (Meyrowitz 1986, viii). But communication technologies are inherently spatial, in that they enable communication at a distance, and as such free communication from a fixed location in urban space. On the one hand such communications technologies, which whilst crucial in supporting the mobility and flux, are also fixed networks that must be embedded in space. But they also consist of physical systems made up of links and nodes that are constructed fundamentally of spatial systems linking together places (Hepworth 1987, quoted in Graham and Marvin 1996, 50). The media theorist Castells has popularized this space as the ‘space of flows;’ a concept where space is understood as linking up electronically separate locations in an interactive network that connects activities and people in distinct geographical contexts. He contrasts this with the concept of the ‘space of places’ which he defines as organizing experiences and activity around the confines of locality. The complexity of the urban condition arises when the emerging space of flows is folded into the space of places (Castells, in Graham 2004, 86)

Similarly, the view of space as some sort of container, which bounds perception and action, no longer provides an adequate description for the spatial manifestation of media technologies. Instead, a more complex framework is necessary, where multiple spaces and times become overlaid within the framework of a single experience such that places are no longer defined by their physical boundaries. Physical boundaries still exist but only to the extent that possibility exists for access to information to be restricted by physical access.

#### *Situations and Encounters*

In common with the proliferation of communications technologies, increased physical mobility has had a similar transformative effect on perception and behavior in spatial settings. In fact, the two conditions are fundamentally linked, since before electronic telecommunications, when all communication necessitated physical movement, action over distance was only possible through physical movement (Graham and Marvin 1996, 114). Movement from situation to situation involved movement from place to place. However, information input and output has replaced modes of transit usually associated with the movement of people or objects traditionally distributed in space (Virilio 1997, 56). When we communicate through new media, where we are physically no longer determines where we are socially. The twin potentials of mobility and communication have undermined the traditional relationship between physical setting and social situation. Walls, doors, gates, and distances still frame and isolate encounters, but

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<sup>4</sup> GPS is an abbreviation for Global Positioning System.

<sup>5</sup> WiFi is an abbreviation for wireless frequency.

communications media increasingly trespass on the situations that take place in physically defined settings. They re-organize the social settings in which people interact, weakening the once strong relationship between physical place and social place (Meyrowitz 1986, ix). Physical presence is no longer a significant factor in the experiences of people and events, since it is both a possibility and a routine to communicate directly with others without meeting in the same physical place. Consequently, the physical frameworks that once created distinct spatial settings for interaction have been greatly diminished in social significance. Communications technologies have further social implications, in that they enable individuals to escape from place-defined groups and conversely permit outsiders to invade unfamiliar group territories without even entering them.

It is not the physical setting itself that determines the nature of the interaction, but the patterns of social information flow. Places are the settings in which people interact, and as such space frames human action and also importantly behavior. In fact, spaces are turned into places when social interactions occur. In order for these places to be meaningful they must work on two levels; they must be present an imageable configuration of physical space which is complimented by a plausible conception of how social interactions can take place in it. As such, spaces become understood as places when they become settings for encounters and situations. However to include mediated encounters in the study of situations there is a need to move away from the notion that social situations are only encounters that occur face-to-face in set times and places (Meyrowitz, 1986, 36-7). The boundaries around social situations affect behavior not only because they often fully include or exclude participants. Communications media affect the definition of situations by bypassing traditional physical restrictions on information flow. By changing the boundaries of social situations, communications media do not simply give us quicker or more thorough access to events and behaviours. They give us instead new events and new behaviours (Carter et al. 1993, 324). The spatial notion of place as defining situations is reduced in significance by communications technologies and instead the social context of the interaction becomes an important characteristic of the setting.

#### *Layered Space*

This has particularly strong resonances for our perception and action in urban public space. The social synthesis between the space of places and the space of flows is realized in public space (Castells, in Graham 2004, 91). Public spaces or territories have a temporary quality and an individual has free access and occupancy rights (Altman 1975, ??). In everyday experience, they are often viewed as the ‘in-between’ spaces of the city; streets, parks and transit routes. As they become increasingly densely interwoven with communications technologies, these everyday public spaces are transformed. A typical urban street is now wirelessly connected through a proliferating array of media, and a similarly wide set of practices associated with the interaction with such media is developing.

The consequence of communications technologies in urban settings is that multiple social realities can occur in one place. The same physical space may be caught within the domain of two different social occasions. The social situations that occur in these overlapping behavior settings support gatherings that possess a special characteristic in

that they exist on more than one social level. The possibility that the same physical space can come to be used as a setting for more than one social occasion is regularly recognized. Thus in the case of public streets, there is a tendency in western society to define these places as the scene of overriding social occasion to which other occasions should be subordinated (Goffman 1963, 20). For example, presence in public space and interaction has traditionally been equated with face-to-face contact. Yet, presence in public space as mediated by new technologies has a different type of aesthetic, no longer dominated by visual access but by informational access. The features and structure of the interaction is enabled by a connection, which is not necessarily achieved through physical movement from one location to another. As such, everyday actions and behaviors no longer belong to particular places, and are now multiplexed and overlaid; there now exists the possibility to switch rapidly from one activity to another while remaining in the same place, so we end up using the same place in many different ways. On one hand, this gives rise to confusion, and ambiguous and contested zones emerge (Mitchell 1995, 101), where the multiple and overlapping behaviors created create disparate, fragmented and discontinuous spatial references. On the other hand, we can consider space as a field of interaction, composed of intersections of mobile elements it is in a sense actuated by the ensemble of movements deployed within it (de Certeau 1984, 117). In this case space is perceived as practiced place rather than a fixed and intransitive bounded entity, and as such emerging practices can only serve to enhance the richness of our spatial experience.

### **Nodes and Networks**

As everyday public space becomes increasingly layered, the nature of spatial identity in these environments is changed. But communications networks tend to be largely invisible and silent, or at most relatively hard to discern, most weave unseen through the fabric of urban spaces, using very little space (Graham and Marvin 1996, 50). These networks bind together places in many different spatial and temporal positions in the form of real time networks. The result is that there is a general tendency for people to ignore or even deny the effects of the invisible environments of media simply because they are invisible.

The immateriality of communications networks is not just a superficial outcome of the technology infrastructure, it is fundamentally intrinsic to the nature of data transmission in such networks. This is in part because such information transfer is achieved through what are termed packet networks. When information is transmitted in a communications network a process occurs where the original data is divided up into uniform sized parcels of bits, called packets. In preparing data to be sent in the network, each packet is labeled with a header stating from which message it was drawn, its position in the message and its destination. Each individual packet is then sent through any communications route that has capacity, so that the original data is literally totally dispersed in the network, and only realized as a whole again when it is reassembled upon reaching its destination (Pool 1990, 33). At each end of the network connection a node provides the sites of arrival and departure for the data, where temporary data may also be further processed or recorded onto memory. Consequently, one can consider the nature of information flow as enabled only through its own fragmentation, such that it is not possible to conceive of the information as sustaining any materiality during transmission. Whilst in transit the content and form of information is thus everywhere and nowhere, in fact it can only be tangibly realized at the node. In wireless networks the data is not even

confined to a cable linking two nodes, but is instead literally transmitted through the air at frequencies or wavelengths close to the speed of light. These abstract material characteristics of communications technologies mean that it is both conceptually and practically complex to form adequate perceptual parallels with existing concrete and imaginable concepts of space.

### *Imageability and Invisibility*

Our perception and action in space is in part made possible by our ability to act on mental models of the space and our position in it, whether physical or social. The question then arises as how we perceive the spaces of communications media in the city, if we can neither see, hear, or touch them nor model their structure on existing bounded spatial concepts. It would seem that the layering of digital and physical space enables us to experience some sort of intertwining of experience, which is subsequently conceptualized. As with mental maps of urban spaces, images of the abstract topologies of communications networks and electronic spaces need to have emotional and subjective information about the qualities of the electronic place found, as well as what is where within the complex and intertwined web of physical spaces (Graham and Marvin, 1996, 122). However it seems that the frameworks of communications media are being mapped too carelessly onto the spatial structures of the city, in part because the dilemma exists of how to give such media spatial and visual form. The lack of coherent visual or spatial identity indicates that such nodal points and networks problematise the creation of meaningful internal or mental representations. Yet, wireless communication technologies are becoming extremely dense in urban settings; each square meter of the city is increasingly populated by nodes, whether public or private, so that their presence cannot be denied in the spatial city. But the manner in which the city is traditionally perceived in visual terms has implications for the image of the city as this has by its own definition an inherently visual form. If these nodes, however dense, are not perceived in visual or spatial terms then they will not enter in the consciousness as an aspect of the imageability of the city. If the overlay of the space of places and Castells' space of flows is working on parallel but mutually incoherent layers this means that cities are becoming invisible to us in certain important ways.

### *Envisaging Urban Nodes*

In order to try to understand more clearly some of the characteristics of the emerging spaces of mobile technologies the series of images that follows will investigate the nature of the visual presence of a series of WiFi nodes in urban public space. The images seek specifically to explore the visual aesthetic of these nodes and to look at the characteristics of the layered public space created in their sphere. In order to deal with the condition more authentically the images are created through a variation of the practice known as wardriving<sup>6</sup>. This involves traveling through the city with specialist equipment for detecting WiFi node locations. In this particular study, a webcam was connected to a laptop, which was programmed to record images when a node was detected. Images were subsequently captured over a period of sixty seconds so as to reflect the changing temporal nature of the condition. The intention of this method of image capture is to

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<sup>6</sup> Wardriving is the practice of detecting and mapping wireless access points.

record more authentically the nature of the visual and aesthetic qualities of the node which is perceived, as it were, from the viewpoint of the technology itself.

Currently many wireless internet nodes are protected by secure encryption, which makes the WiFi network only accessible to the owner or to those authorized by the owner. This study takes place in London, UK where, as in many large western cities, a series of public resources have been established which seek not only to establish but also map the sites of wireless internet access. The images that follow draw on this resource and focus specifically on nodes which have been intentionally made public by their owners. Although these WiFi nodes are typically used for wireless internet access in a physically enclosed space, the hertzian signals from these nodes often spill out from private spaces into public. The information flow ignores the material thresholds of walls and doors, with the consequence that the physical extent or territory of the signal typically extends beyond traditional physically bounded notions of space.



[Insert Image 1.1 here – Landscape]

Image 1.1 Boundless.five

The first node, shown in Image 1.1, is located in Deptford, South-East London and forms part of a larger community project entitled ‘boundless,’ which provides free WiFi access to citizens as part of a nodal network. These projects create new types of public space, characterized not by visible or physical access such as traditional public gathering spaces of parks or street corners, but instead by information access. In these spaces the entrance, provided by the node, is to non-physical territories.

The significance of such access is underlined when it ceases to exist, and the character of the physical space is subsequently transformed. The second image Image 1.2 investigates the site of the London’s first public wireless internet project in Clink Street, located on the south bank of the River Thames. The project was disbanded in the late nineties when a rise in property prices forced the co-operative responsible for the project out of their valuable waterside converted warehouse offices. The site is now occupied by a Starbucks cafe offering only commercial wireless internet access.



[Insert Image 1.2 here – Landscape]

### Image 1.2 belkin 54g

The buildings along the cobbled street have ceased to be a gathering point or a site of coming together where doors were welcomingly left open not just in terms of information access but also social interaction. It has instead assumed a characteristic of bounded space, and as such the pedestrian flow along the adjacent street, whilst ceaseless, no longer has any opportunity to pause en route. The potential for social interaction and thus an important quality of the place is effectively erased, enduring only as a memory or trace of that which once existed.



[Insert Image 1.3 here – Landscape]

### Image 1.3 Thamesonline

In contrast the site of the third node in Image 1.3 provides both a public space to pause briefly and a corresponding open WiFi node. Located within Neal’s Yard, a courtyard surrounded by health-food shops and therapy rooms, which in its central location provides a rare opportunity for meeting without the need to enable this through some form of purchase. It is here that the digital space of the node and the social space of the city seem to compliment one another most fully. The transitory nature of visits in the courtyard, with visitors recurrently entering and leaving from appointments balances alongside the space of flows of the network, with its fluid forming and breaking of linkages enabled centered on the node.



[Insert Image 1.4 here – Landscape]

### Image 1.4 wh wireless

Located nearby is the fourth node, shown in Image 1.4, which is characterized by large gatherings of people, mainly tourists or visitors, but the social interaction is more transitory and never realized as an encounter, for it is too fleeting and superficial. The existing model of access and as site of interaction is exemplified here, but there is almost no availability of public WiFi nodes reflecting a public space that fails to stimulate meaningful interaction. Here the fluid crowds form and disperse, but without exchange or communication, with the experience often remaining purely as a visual encounter with the space.



[Insert Image 1.5 here – Landscape]

Image 1.5 xyzzzy

In order to instantiate a node in a location it must be named or labeled with a tag. Interestingly in all the sites in the study the node names rarely any relation to the static physical location. This is despite the fact that both the hardware and signals from such nodes have a very distinct spatial extent and position. For instance the node in Image 1.5 though located in the particularly distinctive location of Greenwich covered market in south London is denoted by the un-descriptive label of ‘xyzzzy’. Since conventionally it is implicit that space is claimed by the act of naming if this emphasizes the extent to which the nodes are not considered primarily in spatial terms. Instead the node references either the modem hardware which enables the WiFi node or the name of the network, both parts of the technology infrastructure. Indeed the very vagueness of the word node indicates the loss of a language for naming environmental value (Sennett in Carter et al. 1993, 319). The identity of the node is not perceived as delineating spatial territory or having temporal qualities, whether physical or digital. Nodes are understood more along the metaphor of a switch, which simply establish and break linkages. As such they equate with access to information, where the accessibility of information flows is replacing the visual and spatial quality of access of sight and of body. In this sense, the important notion of visibility in the city as equating with physical and social access is being transformed into access to information.

### Summary

We live, act and orient ourselves in a spatial world which is richly and profoundly differentiated into places. They are sources of security and identity and they qualify our perception and actions. Yet, we do not perceive the spatial world through our senses alone, but engage in many strategies to order to make the spatial world knowable. The resulting mental construct is an environmental image; a highly personalized model of the external world which includes physical features and qualities. However, our essentially spatial perspective on the world is called into question with mobile and wireless technologies, a form of ubiquitous computing where the focus is not on the technology itself but rather on what it is enabling. The physical world comes to be considered as part of the space of the digital interaction. Yet the converging of physical and digital space gives rise to a series of significant transformations in perception and action in social situations. The nature of this experience is most concentrated in urban public space, where the virtually invisible quality of the nodes and networks of communications technologies create multiple and sometimes inconsistent layers of physical and digital space. The physical ‘glue’ holding space together is thus transformed, such that instead of thinking of specific places with boundaries around, they can be imagined concurrently as

articulated flows in networks of social encounters and situations. These more fluid and abstract notions of space interrupt our mental images of space since physical form and visual appearance have conventionally shaped our perception in the spatial city. As such the nodes and networks are coming to be considered along the lines of the social interaction that they facilitate, with the pattern of breaks and linkages to the invisible flow of communication mapped densely over the space of places.

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