

From cafe to parkbench: Wi-Fi® and technological overflows in the city

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Wireless: technology that permits the active transfer of information involving emanation of energy between separated points without physical connection.(Wolfowitz 2004)

Mobile digital communications connect movements of people to movements of data. Wi-Fi, a 'wireless technology' in U.S. Assistant Secretary of Defence Wolfowitz's terms, connects people and data in a quite complicated cultural-technological mix. In certain contexts, it dispenses with the wires that connect computers and the Internet. But this mundane innovation in new media infrastructure seen in many domestic, commercial and organisational settings, can be interpreted as significant in different ways:

[T]he real value of a satellite television broadcast, a WiFi connection to a laptop, or a mobile phone call from your car to your mother isn't the absence of dangling wires. Mobility, portability, ubiquity, and affordability are all enhanced when signals pass through the air rather than through strands of copper or optical fiber. (Werbach 2003)

This chapter argues that the values of 'mobility, portability, ubiquity and affordability' involve a mutual contextualisation of movements and images of movement. Put more baldly, the plethora of figurations, practices, commodifications, pricing-models, gadgets and modifications associated with Wi-Fi can be seen as an image of movement as well as an infrastructure that re-positions people in

relation to movements of data. The analytical problem confronting evaluations of heavily-imagined mobile technologies is how to hold together images of movement and movement itself.

1. Off the lead in Piccadilly

In November 2003, Broadreach, a London-based Wi-Fi Internet Service Provider (ISP), opened a free Wi-Fi 'hotzone' centred on Piccadilly Circus. This company is one of dozens currently seeking to commercialise Wi-Fi networks by offering pay-by-the-minute wireless Internet connections in various public and semi-public places such as railway stations, departure lounges, hotel lobbies, train carriages, service stations, fastfood restaurants, cruise liners, trailer parks, public parks and cafes (e.g. (Abreu 2003; Glasner 2003; Smith 2004)). In most cases, these services consist of a wireless access point providing high bandwidth Internet coverage up to several hundred metres for customers carrying a Wi-Fi equipped device (laptop, PDA, VoIP - Voice over Internet Protocol - mobile phone, etc). In contrast to the more well-established and visible Internet cafes (Wakeford 2003; Miller and Slater 2000), customers use their own equipment and sit or move around according to what they are doing. By dissolving the physical connection of wires, Wi-Fi allows a re-positioning of some now mundane everyday practices associated with new media. Wi-Fi networks themselves are usually formed on an ad hoc basis, since people come and go, making and breaking connections to the network. Because of their limited coverage, these small networks are usually called 'hotspots'. Since their inception in 2002, the cost and difficulty of logging on to these hotspots has meant they have not been heavily used. Dire predictions of another dot-com style collapse have abounded in IT and business pages of print and on-line media:

Hopes that the roll-out of wireless broadband networks - so-called wi-fi hotspots - will result in a profits bonanza will be dashed, the technology consultancy Forrester has warned. "With all the hype today about the rollout of... public hotspots, it's as if the dot.com boom and bust never happened", said technology analyst Lars Godell. (Weber 2003)

Despite or perhaps because of these predictions, many efforts are being made to expand the coverage and extension of these Wi-Fi hotspots, to extend them beyond the precincts of the cafe to include the surrounding streetscape or adjacent open spaces. In Broadreach's case, a new degree of spatial extension was achieved by linking adjacent hotspots located in different cafes, offices and bars together to form a *hotzone*. Their achievement had been to extend the spatial extension of the network: '[t]he zone stretches from the east end of Piccadilly, from Church Place onwards, through Piccadilly Circus and down Coventry Street as far as Wardour Street' according to the Broadreach press release (Smith 2003). This significant location in London, connects a central node of the tourist geography of London to a street associated with new media, advertising and fashionably high-tech companies.

In late November 2003, at the height of the Wi-Fi boom, I was sitting on the steps of the monument in Piccadilly Circus with a laptop computer. In the morning, I had interviewed an artist using Wi-Fi networks to broadcast 'local television' in the park at Bedford Square. Embarrassed to be using a laptop on steps covered with tourists and lunching city workers, I spent only a few minutes trying to locate the Broadreach hotzone. Given that the whole area was well within the hotzone, and that access to the network was supposed to be free for that month, it seemed like a good opportunity to see what it would feel like to connect to the Internet in the midst of the London buses, the taxis, the barrage of signage and flows of people moving towards Leicester Square and Charing Cross Road.

There was no Wi-Fi signal. I could make no connection. Disappointed, I shut the laptop and walked down toward Leicester Square. But my failure to 'find the network' in one of the most networked zones in the UK is not the end of the story. I headed for lunch in a cafe closer to Charing Cross Road. A huge lunchtime crowd of people were flowing in both directions, going in and out of shops, cafes and cinemas. A few metres ahead, a small dog, a Yorkshire terrier, was trotting along, weaving between people, occasionally looking back over his/her shoulder. The dog was clearly not

a stray or a street dog. It was well-fed and groomed, but a little anxious. Sometimes it veered off, as if to take a turn up a side street, but then it moved back into the main stream of people. Sometimes it sped up only to slow down again. Not only couldn't I connect to the Wi-Fi hotzone, I was starting to feel responsible for a small lost dog. I was on the point of calling to the dog, when it looked back over its shoulder towards the other side of the pedestrian area. Strolling on that side, parallel to me, was a casually dressed man carrying a dog lead. He steered closer to me. In a friendly way he said something like 'she knows where she's going.' Feeling somewhat foolish yet again, I turned into a cafe, which I think must be part of the hotzone network, and tried again to connect to the network. When no signal appeared, I gave up and ordered lunch.

2. Folding data into places

What lesson can be drawn from this unsatisfying anecdote of Wi-Fi in the city? In respect to the dog, the connection was hard to see because of the absence of leads (or wires) and because of the flow of people that separated dog and human. The dog was not on the leash. This, the man might have said, is because a leash can get tangled in the movement of a crowd. Moving through a crowd with a dog on leash, even an 'obedient dog', is harder than moving independently. But how did the dog maintain a connection to the movement of the accompanying human? What I saw as 'being lost', as uncertainty or even anxiety in the crowd, was for the dog a relatively continuous, visual coordination of its path with a companion human. Is it taking the parallel too far to ask whether the contemporary problem of moving physically while keeping the networking connection to everything we do is comparable to the watchful, anxious movement of a dog through a crowd of people?

The problem this chapter addresses is how to think about what is happening to networked communication after the dot-com crash, that is, in the ruins of projects, academic or otherwise, that treat digital communication as situated in a space apart from mundane, everyday, geographical, and geopolitical space (Lovink 2003). The network society of the 1980s and 1990s moved ever-

mounting piles of information between points on relatively geographically fixed networks. These movements triggered the effects of virtuality that have been the object of such energetic academic, political and economic contestation over the last decade (Miller and Slater 2000). The dot-com boom was animated by the image of placeless, seamless flows of information. The circulation of capital through financial markets speculating on eCommerce was mutually contextualised with images of data on the move magically pervading the texture of everyday life. 'Rather than being seen as technologies to be adopted and shaped within the fine-grained practices of everyday urban life, new media were cast thus in this dominant discourse as a dazzling light, shining above everyday concerns' (Graham 2004). One response to that dazzle has been to see attention to 'everyday concerns' or what people actually do as an antidote. However, what makes the analytical recourse to everyday life difficult to accomplish is the panoply of figurations of new media as changing 'everyday concerns.' The notion of everydayness has become particularly problematic precisely because it has become the focus of images of new media change. In other words, the lesson of the dot-com/virtuality conflagration has been learned not just by academic criticism.

In the last three years, wireless networks for computer communications have burgeoned in settings ranging from 'remote places' such as Everest Base Camp and Nepalese yak farmers, rural villages in Cambodia to the 'first wireless nation' (Nuie). But it is in everyday locales such as railway stations, trains, airports, public parks, cafes, schools and houses that these networks have been most often set up, used and figured. Wi-Fi networks have found myriad uses - streaming audiovisual materials throughout the home, tracking children in Legoland, monitoring the growth of grapevines or wildfires through wireless sensor networks, or, more ambitiously, replacing corporate-owned telecommunications infrastructure with community-owned communications networks (Picopeering Agreement). Incontestably, the proliferation of Wi-Fi networks afforded an increase in the mobility of digital data. But equally incontestably, the proliferation of Wi-Fi has been the object of mobilisation of a vast number of projects, reports, opinions, and enterprises of many different kinds.

However, unlike much more general phenomena such as the WWW, Internet Relay Chat (IRC) or email, Wi-Fi concerns the folding of data into specific places. It is as if the diversity of Wi-Fi projects and the production of images of Wi-Fi networks anticipates critical calls for an urban new media studies based on fine-grained practices of everyday life. To describe the flows of data on Wi-Fi networks then would be to move across many different urban places, to cross many boundaries between public and private, between institutions and commerce. As the data flows across many boundaries, they encounter many differences relating to global-local, individual and collective identity, political participation, media, economy and technologies. A phantasmagoria of critical new media consciousness, Wi-Fi, as a constellation of attempts, projects, experiments, marketising initiatives and regulatory policies, generates constantly varying forms. These forms negotiate differences, uncertainties, obstacles in the 'fine-grained practices of everyday life'. Individuals, groups, and corporations develop embodied, institutional or commodified forms that feed further imaginings of mobility, ubiquity, portability and affordability. Images of data moving and data in movement follow each other, like the dog and its walker moving through the streets of London.

[OK, I follow this, but the final sentence is quite fuzzy: how can Wi-Fi 'practically imagine' something - isn't it people who do the practices and the imaginings? So isn't it users of Wi-Fi who you mean to say through their practices negotiate these differences and in doing so constantly vary the forms which Wi-Fi takes, and hence how we might imagine it?]

3. City in the Hertzian landscape

The desire to place new media technologies above everyday life in the city remains strong. For instance, in describing changes associated with wireless communication, the architectural writer W.J.T. Mitchell recently proposed the notion of the Hertzian landscape:

Every point on the surface of the earth is now part of the Hertzian landscape-the product of innumerable transmissions and of the reflections and obstructions of those transmissions.

(Mitchell 2003 55)

The idea of the Hertzian landscape follows from a discussion of 'Hertzian space' in (Dunne and Raby 2001) and refers to a landscape of data transmission. Some parts of the earth lie within cities. Other points on the surface of the earth lie in the middle of the sea. On the Hertzian landscape, these distinctions do not matter. Mobile phone networks, television and radio transmissions, wireless data networks weave together to make a 'landscape' that overlays and overflows topographical, geographical differences between points. But this landscape, which has become a site of major commercial, cultural, military and regulatory contestation is not easy to map or manage. It lacks the visibility and stability of other forms of space and property. It is more like sea than land. To the extent that it escapes full regulation, it is a smooth rather than striated space (Guattari and Deleuze 1988). A point on the geographical landscape spread across different points on the Hertzian landscape, because different signal transmission are present there.

In his account of the networked self in the contemporary city, Mitchell places great weight on certain kinds of networks exemplified by mobile phones and less obviously by the wireless computer networks popularly known as Wi-Fi. What is at stake in wireless networks for Mitchell is a transformation of public space induced by the movements of data between mobile points attached to different networks [NB: somewhere here you may want to cite Sheller and Urry 2003 'Mobile Transformations of Public and Private Life,' in *Theory, Culture and Society*, Vol. 20, No.3, pp. 107-125]. The development of wireless networks, however, changes the stakes according to Mitchell. Now it is a question of 'reactivating' public spaces by bending network fixtures to suit different kinds of local movements:

In general, as these transformations of public space illustrate, there is a strong relationship between prevailing network structure and the distribution of activities over public and private places. ... And where networks go wireless, they mobilize activities that had been tied to fixed

locations and open up ways of reactivating urban public space; the home entertainment center reemerges as the Walkman, the home telephone as the cellphone, and the computer as the laptop (Mitchell 2003 158).

While these changes are often presented as ubiquitous, it is immediately obvious that they are unevenly distributed. Wireless networking, the 'next big thing' after the Internet could easily re-inject another version of the oft-mentioned digital divide into the technoscape (Appadurai 1996, 34). The principal stake in the political economy of the Hertzian landscape can, therefore, be framed as a question: who today can send what? The flows of messages, images, texts, conversations, audiovisual sequences, control data, and transactions that move through the Hertzian landscape are subject to many different obstacles, conflicts, competitions, and delays. The Hertzian landscape itself shifts as it undergoes rapid transformations. Countering the total vision of the Hertzian landscape posited by Mitchell, it might be possible to argue that Wi-Fi re-positions some existing communication practices in quite mundane ways. But in consonance with the affective tone of Mitchell's account, it is possible to see the actual projects and practices constantly overflowing or exceeding themselves in interestingly symptomatic ways.

4. Overflows

In Wi-Fi (or 802.11 Wireless Local Area Networks), data flows differently in the fabric of urban places. More precisely Internet Protocol (IP) data takes new paths, without physical connection, through built environments. In analysing this landscape of data flows (some urban studies take the form of showing that flows of people, things, images and data structure city space (Castells 2004, 85)), the notion of flow as shaping the city can be supplemented by a notion of *overflow*. The flows of data and the re-positioning of everyday practices associated with Wi-Fi are examples of movement that could, generalising a notion proposed by (Callon, Barry, and Slater 2002), be called 'overflow'. The notion of overflow incorporates the notion of flow and circulation as structuring the

city, as folding data into places. But it entails certain forms of excessive flow, phenomena exceeding the scope and parameters represented and regulated within normative framings of networks as connecting people. By virtue of these overflows, identities, embodiments, feelings, affects, images, gestures, and habits attach to flows. Put abstractly, the point would be that flows are never -contained. They are relational entities. The ontological instability of flow consists in overflow.

The concept of overflow found in (Callon, Barry, and Slater 2002, 287) suggests that technologies constantly create uncertainties in relation to identities, institutions, debates and practices. This is not due to any intrinsic property of a particular technology. Rather it stems from the way technologies are enmeshed with markets and consumption. Callon writes:

There's a strange meshing of techno-sciences and economic markets which produces what Marilyn Strathern calls the proliferation of new identities and which constantly creates new uncertainties about the constitution of the collective. So this constant creation and proliferation of the social (or what we propose to call emerging concerned groups) requires new procedures, new institutions, political institutions, new forms of debates and so on. (Callon, Barry, and Slater 2002, 287)

A related point had already been made by Appadurai when he wrote that movements and images of movement mutually contextualise each other (Appadurai 1996). In other words, flow as continuous movement and image as figure or form are integrally related (Gaonkar and Povinelli 2003). While Callon does not discuss images to any great extent, the main motivation to introduce the notion of overflow is to complicate the idea of flow as an effortless achievement or a quasi-automatic process, and to show that a flow can be intrinsically animated by an interplay between images and movements. While overflows may later disappear, every technology passes through a time during which an 'interactive stabilisation' is needed to establish its boundaries.

For the purposes of illustrating how overflows give rise to flows, three different categories of Wi-Fi related phenomena are useful:

- personal-infrastructural;
- technico-practical;
- cultural-economic.

The hyphenated categories are not exhaustive but mark out zones of contestation associated with Wi-Fi. By their very nature, overflows are actually quite hard to separate from each other, but this categorisation of Wi-Fi overflows provides a way to sort the sheer abundance of images, reports, accounts, advertisements, and announcements in the years 2002-2005.. Rather than simply making an equation between Wi-Fi and data mobility, the notion of overflows suggests that the plethora of concrete implementations, projects, and practices are also an imaging- imagining of flow. It is this instability between image and movement the concept of overflow helps to track.

5. Personal-infrastructural overflows in cafe & park

Images of mobility figure data as moving effortlessly throughout the Hertzian landscape, and particularly throughout the open urban places such as parks and outdoor cafes (Toshiba Corporation 2003). To take two specific places, what is at stake in the mobility of digital data in cafes and parks? Both are places that have been significant in the life of cities. It would be possible to point to histories of cafes as spaces of contestation and dissent, and to mention their role in the formation of Western democracy (Anderson 1989; Habermas 1989). Parks and gardens too, have a significant socio-political history in the invention of publics and social movements that will not be recounted here. Leaving this aside for the moment, I am interested in seeing how movements of data through

these urban places challenges both how we think about new media in cities, and what it might mean in terms of developing a relevant theorization of new media in everyday urban life.

Movement of data on the Hertzian landscape occurs only when certain boundaries are negotiated and a certain co-ordination between movements of bodies and movements of data are accomplished. It implies a changed relation between person and communication infrastructure. The key issue here is how movements of data can be reliably connected to particular individuals. With fixed infrastructures such as telephone networks, the systems of identification that attach points in the infrastructure to particular people are highly developed, place-related and regulated by contract or law. In principle, the technology of Wi-Fi poses no problems in terms of connections between people and infrastructure. It simply allows existing practices of computer usage to re-position themselves slightly. When a Wi-Fi network is installed in a cafe, a fast-food restaurant, a hotel lobby or departure lounge, it seems to change nothing. All it promises to do is allow people to carry out computer-mediated communication without having to plug computers or digital devices into a wall socket (telephone or Ethernet). Many media accounts of Wi-Fi hotspots in cafes present them in just such terms: Wi-Fi changes nothing, it is only an incremental step (Wainwright 2003). But this change has been remarkably difficult to accomplish in certain respects. In some contemporary parks and cafes, movements of people and data are connected, but only after changes in the relation between the person and the infrastructures of communication have occurred. Hotspots alter patterns of spatial, temporary and intersubjective relations, and impose new orderings of those relations. These orderings have to become more or less habitual before the connection between person and infrastructure becomes tenable. In short, the accomplishment of this re-positioning requires a large number of other changes to have occurred, and these are by no means straightforward and uncontested.

The management of this mundane re-positioning implies many other changes. My attempt to surf

the World Wide Web from Piccadilly Circus relied on gestures and perceptions that are familiar habits habitual within the space of office or home. The failure of this attempt to connect to data on the move could have been due to any number of reasons. It could have suffered from a mismatch between the broadcast strength of the Broadreach infrastructure and the antenna sensitivity of my laptop computer, or it could have been a failure on the part of the software to pick up the SSID (the Service Set Identifier) Broadreach was using, or it could have been that I was sitting at the wrong angle on the steps. These possibilities leave aside the increased complications that exist when, as usual, the hotspot is not free of charge. The complications here include high cost, credit card verification difficulties, competing hotspot pricing schemes, and time-based usage schemes which constrain connectivity in particular ways (Macdonald 2004). Such failures are symptomatic. They highlight the diverse kinds of connections and co-ordination work needed to ensure that infrastructure is readily available and relatively invisible. The status of this work is unstable. On the one hand, if it is not done, nothing works. On the other hand, if it is too visible or too explicitly technical, then infrastructure itself becomes an obstacle. As it becomes visible, it no longer functions as an infrastructure.

Other aspects of this kind of personal-infrastructure overflow are easy to find in the context of Wi-Fi networks. Problems of shared infrastructure obsess ISPs (Internet Service Providers) who want to stop their bandwidth leaking into the hands of data-hungry masses. Because Wi-Fi networks overflow physical boundaries such as walls and windows, they can be accessed by unknown others. In 2002, a minor blaze of media interest was ignited by chalk-marks found on streets in London, San Francisco, New York and Melbourne (N/A 2004; Hammersley 2002). These marks indicated the availability of freely accessible Wi-Fi networks. While the practice of war-chalking was itself relatively short-lived, war-driving and war-flying continue the practice of finding, using and sometimes publicising the availability of Wi-Fi networks in urban spaces.¹ Many efforts to map available Wi-Fi networks, and to publicise their locations through websites exist. In relation to

infrastructure, the established differences between self and other have become complicated. For instance, does an 'open' wireless access point mean that its owner is happy for anyone nearby to make use of it? War-chalking websites syndicate information about open wireless access points:

Thu Apr 22nd, 2004 at :13:27 AM EST

Plant yourself in The Lemon Tree just off Trafalgar Sq and access the interweb for free, sitting at the window. There is an open access point that hasn't been chalked yet. It has nothing to do with the pub but thought you'd may as well have a pint! Enjoy. n.b. This point was open on friday night 16th April. (Hero 2004)

The ethics and legalities of sharing the wireless network inadvertently left open by someone in the neighbouring apartment or office block are complicated (Cohen 2004). On the one hand, it could be seen as bandwidth theft, and certain broadband ISPs have sought to present it that way (Charny 2002). On the other hand, others propose it as ethical resistance to the security sensitivity that recently led the US Department of Homeland Security to announce that Wi-Fi networks constitute a critical threat to the national information infrastructure (Boutin 2002), and the US Department of Defence to declare that consumer-grade Wi-Fi equipment must no longer be used by soldiers (Jardin 2004; Wolfowitz 2004). The key point, however is that the personal-infrastructure relation is being imagined in different ways. Different practices experiment with the altered spatial, corporeal, financial and organisational relations between person and infrastructure. The first kind of overflow concerns the way in which habits and familiar patterns of movement, whether of people or data, are constructed and contracted around infrastructural changes in communication technologies. This overflow, rather than changing the devices themselves, or resulting in a proliferation of modifications and repackagings, involves an interactive and simultaneous adjustment between person and systems in which various spatial boundaries and physical obstacles to movements of people and data are negotiated. [NB: In Sheller and Urry 2003 we refer to 'persons' in a sense overflowing their physical boundedness through the dispersal and retrieval of personal data]

6. The techno-practical overflow

The 802.11b technology was designed for office environments and local area networks confined to limited precincts within a range of a few hundred metres (IEEE 1999). But many projects and inventions have shifted the technical limits of 802.11 communication protocols devices in unexpected ways.

A first kind of technico-practical overflow involves modifications of the spatial extension of Wi-Fi networks. New kinds of antennae, often made from readily available materials such as Pringles cans, cooking equipment or old domestic satellite dishes have extended the range of connection to kilometers; new kinds of software have been developed that allow people to link Wi-Fi hotspots together so that data can leap-frog across wireless networks to and from wired or cabled infrastructures (Negroponte 2002; Batista 2003). In addition to the spatial overflow of the limited range intended for Wi-Fi, and the networking of Wi-Fi networks together in meshes of connections through very various coordinating projects that include community networks and commercial wireless internet service providers (WISPS), the technical protocols for Wi-Fi are now being re-packaged in a gamut of devices and technical assemblages that include bikes (Gitman 2004), lamp-posts (Kewney 2004) cars (Best 2004), shopping-carts (Zuniga 2003), telephones (Datamonitor 2004), and myriad other devices. Many of these devices shift the border between infrastructure and the information that it carries. By making infrastructure more or less visible, information itself begins to move differently and to enact different kinds of collective mobility.

The practical affordances they may permit for their inventors or participants are less important than the ways in which they make flows of wireless data appear more labile, more potentially mobile, less constrained than the existing configurations of the technology presented in commercial productions, user manuals or commercially advertised wireless internet services. Scholarly analyses

of new media technologies have justifiably criticised the hyperbole that imbues advertising and mass media images of technology (Morley 2003). These images often promise freedom from constraint, and elimination of the impediments and obstructions posed by others. Strikingly, Wi-Fi has been accompanied by many imaging practices that diverge from this hyperbole, and take it in different directions. The *Consume* project based in Greenwich, London, seeks to syndicate community networks through a collaboratively constructed Web-based register of wireless access points (Consume 2003). By registering personal or group-run Wi-Fi access points, and showing them on an online map, the *Consume* project has tried, with varying degrees of success, to 'trip the loop' or construct an alternative infrastructure to that offered by commercial broadband internet service providers. *Consume's* searchable community hotspot locator preceded the Web-based corporate hotspot locators run by Intel and other commercial wireless service providers. The utility of the *Consume* website and database is hard to gauge, but ideas of a mesh of publically accessible wireless access points covering London quickly circulated through mainstream and online media. The *Consume* website, with its databases and maps presented an image of extended city-wide connectivity that exceeds and complicates the image of Wi-Fi as an office or building-limited network. [NB: It is not entirely clear what makes this example a 'techno-practical overflow', please explain]

7. Collective-cultural-political overflows

The final form of Wi-Fi-related overflow concerns the constitution of collective life in the city. The city and the political are closely linked for Western political traditions because special places in the city are significant to communicative praxis. These places, including cafes, coffee houses, squares, parks, malls, courts (in all senses), halls and houses, form the material fabric and infrastructure of the public sphere. Special places need to be rethought in the context of different patterns of movement and new forms of communication occurring in them. In exploring the implications of overflows, Callon asks:

[I]f you consider overflows, you don't know who is concerned. Is it an individual? Is it a group of individuals? Is it a hybrid collective, mixing humans and non-humans? Nobody is able to answer this question. So it's a principle of uncertainty about what the collective is made of, or will be made of. The notion of citizenship is usually linked to the notion of an individual or society made of individual citizens who have to be integrated, and who have to be more active in order constantly to recreate and rebuild the social link. (Callon, Barry, and Slater 2002, 288) In the National Mall, Washington D.C., one of the most potently symbolic public parks for Western nation-States, the OpenPark Wi-Fi project intends to assist in the re-invention of democracy for the 21st century (OpenPark.net 2004). As in many other public parks and squares (Bryant Park (Bryant-Park 2003), Central Park), this Wi-Fi project provides free Internet access for anyone visiting the park. However, here within the National Mall precinct, Internet access is linked to democratic public criticism by assembled citizens rather than simply an enthusiasm for consumption of online information. In their press releases and website, the OpenPark project somewhat optimistically suggest that the democratic mechanisms of representation can now be rejuvenated through flows of Internet-enabled public criticism: '[f]ree hotspots for democracy - so that citizens can communicate with each other online when exercising their 1st Amendment rights' (OpenPark.net 2004).

While it is hard to take OpenPark's hope to rejuvenate democracy through communication seriously in the face of other obstacles to political change, it is possible to treat the introduction of Wi-Fi in the National Mall more generally as an intervention in the constitution of the collective seriously. The overflow in this case runs between technology and the political, but as in earlier cases it involves an interaction or contextualisation between flows of data and images of movement. In all the projects I have examined, and all the instances of Wi-Fi I have looked at, a practical accomplishment of data mobility is closely coupled with an image or representation of freedom of movement. In fact, it would be possible to say that rather than being practical projects, everything I

have discussed has been in some sense an image of movement. In these images, practical accomplishments such as a Wi-Fi network in a public park, a new kind of antenna that extends coverage, or a different way of connecting networks together through a web-enabled database appear as figures in a scene that portrays some shift in identity, relations between people, or way of inhabiting a place. OpenPark is no different, except that in this case, a constitutional freedom of speech associated with people assembling in public place is linked to the movement of data through that place.

A final example makes the point most directly. The ParkBenchTV project, installed by the artist Pete Gomes in Bedford Square, Bloomsbury, London, seeks to provide local TV coverage for people who habitually sit on the benches in the square (Gomes 2003). Existing television signals already cover this spot, but these signals are national broadcast. ParkBenchTV broadcasts local content, preferably relating to the Bloomsbury neighbourhood, from a WiFi antenna on the roof of a nearby building. It repositions TV audiences, shifting them away from the living-room sofa onto the public space of the square. In general, what I am calling a collective-cultural-political overflow in this context concerns how there is no possibility of conclusively defining the forms, the places or ways in which a Wi-Fi network can re-position existing communicative practices without taking account of the structuring of emotions, feelings, beliefs and perceptions concerning the act of communication. It is this that ParkbenchTV highlights most succinctly by turning Wi-Fi into the platform for a new version of an existing media form.

The question is whether changes in the forms of communication and the kinds of flow associated with communication can be understood in terms of existing institutions of political life within the city. Do projects such as OpenPark, and even perhaps ParkBench miss some of the uncertainties, the impossibility of knowing who today sends what?

Conclusions

Manuel Castells writes:

Moving physically while keeping the networking connection to everything we do is a new realm of the human adventure, on which we know little. (Castells 2004, 87)

The problem of how to keep data moving in a way that is synchronised with the movements of a person is leading to the development of many different kinds of habit, anticipation and systematisations of mobility (Thrift 2004).

One analytical response to this situation is to introduce a new theoretical abstraction to explain communicative praxis. The idea of the Hertzian landscape is one such response. Similar ideas run through much futurological and policy work on telecommunications today (Werbach 2003). Such responses risk making the same 'mistake' made by earlier responses to the Internet. New patterns of information movement are treated as detached from or of a different order to existing forms and practices of everyday life. A more critical response draws on geography, sociology and cultural studies to argue for a new hybrid discipline, 'urban new media studies,' which would locate movements of data in relation to everyday practices in the city. The nexus of 'urban' and 'new media' already signals a localisation and specificity of analysis that the Hertzian landscape mostly lacks.

In some respects, the analysis of overflows developed here heads in that direction. However, the question is whether locating flows of information and data in the city goes far enough. The problem of analysing communicative flows in the city is complicated by the history of new media, a history replete with images and imaginings of movement, perception and action. On the one hand, wireless networks are imagined as the 'next big thing' after the Internet. The feeling that the mobile Internet is 'what comes next' runs strongly throughout corporate, governmental and art projects associated with Wi-Fi. In this respect Wi-Fi recycles and remediates many of the same claims, beliefs, images,

values and emotions associated with earlier new media and digital culture - the promise of pure fluidity, absence of obstacles or constraints. On the other hand, the three kinds of overflow discussed above mix images of movements with practical negotiations of movement within everyday urban settings. In each case, the image of movement without obstacles encounters practical obstacles, to which different responses, forms and social-technical formations arise. This is the chief problem that confronts urban new media studies - how to analyse the mutual contextualization of images of movement and movement itself, particularly when movement itself becomes an image.

Like the dog off lead in Piccadilly Circus, Wi-Fi enhancements of 'mobility, portability, ubiquity and affordability' trigger complex negotiations between what can be seen and what can be done, between imagining and acting. In the course of the three years 2002-2005, wireless networks became unremarkable parts of everyday domestic, commercial and organisational infrastructural. But they also led to a remarkable process of variation and modulation of data connectivities that are neither hype or operational implementation alone contain. Data flow, this paper has argued, needs overflow, proliferation or excess of identities, figures and practices. Mobilities do not always simply move, but function as images that channel further action.

References

- Abreu, Elinor Mills. *PluggedIn: Web Access in the Clouds Coffee, tea or WiFi?* Reuters News,, Sat February 15, 2003 08:53 AM 2003 [cited. Available from <http://www.reuters.com/>.
- Anderson, Benedict. 1989. *Imagined communities : reflections on the origin and spread of*

nationalism. London: Verso.

Appadurai, Arjun. 1996. *Modernity at large: cultural dimensions of globalization*,. Minneapolis: University of Minnesota Press.

Batista, Elisa. 2004. *Mesh Less Cost of Wireless*, 13 February 2003 2003 [cited 14 June 2004]. Available from <http://www.wired.com/news/business/0,1367,57617,00.html>.

Best, Jo. 2004. *BMW and HP to make Wi-Fi Beemers for high-flying execs*, 5 May 2004 2004 [cited 20 May 2004]. Available from <http://networks.silicon.com/wifi/0,39024669,39120476,00.htm>.

Boutin, Paul. 2004. *Feds Label Wi-Fi a Terrorist Tool*, 6 December 2002 2002 [cited 14 June 2004]. Available from <http://www.wired.com/news/wireless/0,1382,56742,00.html>.

Bryant-Park. 2004. *The Bryant Park Wireless Network* 2003 [cited 7 May 2004]. Available from <http://www.bryantpark.org/amenities/wireless.php>.

Callon, Michel, Andrew Barry, and Don Slater. 2002. Technology, politics and the market: an interview with Michel Callon. *Economy and Society* 31 (2):285-306.

Castells, Manuel. 2004. Space of flows, space of places: materials for a theory of urbanism in the information age. In *Cybercities reader*, edited by S. Graham. London: Routledge.

Charny, Ben. 2004. *Cable companies cracking down on Wi-Fi*, 9 July 2002 2002 [cited 23 January 2004]. Available from http://reviews.cnet.com/2001-3244_7-0.html?legacy=cnet&tag=news-rr.

Cohen, Randy. 2004. The Ethicist: Wi-Fi Fairness. *New York Times*, 8 February 2004.

Consume. 2003. *Consume the Net* 2003 [cited 4 December 2003]. Available from <http://www.consume.net/index2.php>.

Datamonitor. 2004. *Skype: giving wireless PDAs a new voice*, 9 April 2004 2004 [cited 12 April 2004]. Available from http://www.theregister.co.uk/2004/04/09/skype_voip_pdas/.

Dunne, Anthony, and Fiona Raby. 2001. *Design noir : the secret life of electronic objects*. [London]: August/Birkhäuser.

- Gaonkar, Dilip Parameshwar, and Elizabeth A. Povinelli. 2003. Technologies of Public Forms: Circulation, Transfiguration, Recognition. *Public Culture* 15 (3):385–397.
- Gitman, Yury. 2004. *Magic Bike :: Wireless Access Bike* 2004 [cited 4 June 2004]. Available from <http://magicbike.net/about.html>.
- Glasner, Joanna. 2004. *Trailer Parks Convert to Wi-Fi*, 27 May 2003 [cited 12 March 2004]. Available from <http://www.wired.com/news/business/0,1367,58784,00.html>.
- Gomes, Pete. 2004. *Welcome to Park Bench TV!* 2003 [cited 22 June 2004]. Available from <http://parkbentv.org/frameindex.html>.
- Graham, Stephen. 2004. Beyond the ‘Dazzling Light’: From Dreams of Transcendence to the ‘Remediation’ of Urban Life: A Research Manifesto. *New Media & Society* 6 (1):16-25.
- Guattari, Félix, and Gilles Deleuze. 1988. *A thousand plateaus : capitalism and schizophrenia*. London: Athlone, 1988.
- Habermas, Jürgen. 1989. *The structural transformation of the public sphere : an inquiry into a category of bourgeois society, Studies in contemporary German social thought*. Cambridge, Mass.: MIT Press.
- Hammersley, Ben. 2002. Working the web: Warchalking. *The Guardian*, Thursday July 4, 2002.
- Hero, Anonymous. 2004. *Plant yourself in The Lemon Tree* 2004 [cited 25 May 2004]. Available from <http://www.warchalking.org/section/pics>.
- IEEE. 1999. IEEE Std 802.11b-1999 Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Higher-Speed Physical Layer Extension in the 2.4 GHz Band. New York: Institute of Electrical and Electronics Engineers, Inc.
- Jardin, Xeni. 2004. *Wartime Wireless Worries Pentagon*, 26 May 2004 2004 [cited 28 May 2004]. Available from <http://www.wired.com/news/politics/0,1283,63604,00.html>.
- Kewney, Guy. 2004. *Wireless lamp posts take over world*, 15 January 2004 2004 [cited 14 February 2004]. Available from <http://www.theregister.co.uk/content/69/34894.html>.
- Lovink, Geert. 2003. Hi-Low: The Bandwidth Dilemma, Or Internet Stagnation after Dotcom

- Mania. In *Dark Fiber. Tracking Critical Internet Culture*: MIT Press.
- Macdonald, Nico. 2004. *Wi-Fi in the real world - pt. 1*, 11 February 2004 2004 [cited 23 February 2004]. Available from <http://www.theregister.co.uk/content/69/35461.html>.
- Miller, Daniel, and Don Slater. 2000. *The Internet :an ethnographic approach*. Oxford & New York: Berg.
- Mitchell, William J. 2003. *Me++*. *The Cyborg Self and the Networked City*. Cambridge, MA & London: MIT Press.
- Morley, David. 2003. What's home got to do with it? Contradictory dynamics in the domestication of technology and the dislocation of domesticity. *European Journal of Cultural Studies* 6 (4):435-458.
- N/A. 2004. *Warchalking: Collaboratively creating a hobo-language for free wireless networking.*, 25/05/2004 - 17:26:40 2004 [cited 12 May 2004]. Available from <http://www.warchalking.org/section/pics>.
- Negroponte, Nicholas. 2002. Being Wireless. *Wired Magazine* 10 (10).
- OpenPark.net. 2004. *The Open Park Project (Open Park): WiFi internet access on the National Mall* 2004 [cited 12 June 2004]. Available from <http://www.openpark.net/>.
- Smith, Tony. 2003. London gets UK's first Wi-Fi 'hotzone'. *The Register*.
- . 2004. Wi-Fi in the real world - pt. 2. In *The Register*.
- Thrift, Nigel. 2004. Remembering the technological unconscious by foregrounding knowledges of position. *Environment & Planning D: Society & Space* 22 (1):175-191.
- Toshiba Corporation. 2003. Enter the World of Freedom Computing Promotional Brochure.
- Wainwright, Martin. 2003. The Future is Nearly in Sight. *The Guardian*, 31 July 2003, 21-22.
- Wakeford, Nina. 2003. The Embedding of Local Culture in Global Communication: Independent Internet Cafés in London. *New Media & Society* 5 (3):379-399.
- Weber, Tim. 2003. *Wi-fi will be 'next dot.com crash'*. BBC News UK Edition, 2003/06/20 2003 [cited 12 December 2003]. Available from <http://news.bbc.co.uk/1/hi/business/3006740.stm>.

Werbach, Kevin. *Radio Revolution. The Coming Age of Unlicensed Wireless* 2003 [cited. Available from <http://werbach.com/docs/RadioRevolution.pdf>.

Wolfowitz, Paul. 2004. Directive number 8100.2 Use of Commercial Wireless Devices, Services, and Technologies in the Department of Defense (DoD) Global Information Grid (GIG), edited by D. o. Defense.

Zuniga, Ricardo Miranda. 2004. *The Public Broadcast Cart* 2003 [cited 12 March 2004]. Available from <http://www.ambriente.com/wifi/index.html>.

1 The terms 'war-chalking', 'war-driving' and 'war-flying' extend a cracking technique from the 1980s known as 'war dialing' that used a program to dial a range of phone numbers and recorded those that might be entry points to computer or telecommunications systems {Raymond, 1996 #70, 477}