

# **Managing Mobility: Location-Based Services and the Politics of Mobile Spaces**

**Heather Maguire<sup>1</sup>**

**“Mobile 2.0: Beyond Voice?”**

**Pre-conference workshop at the International Communication Association (ICA)**

**Conference**

**Chicago, Illinois**

**20 – 21 May 2009**

---

<sup>1</sup> PhD Student  
Joint Programme in Communications & Culture  
York and Ryerson Universities  
Toronto, ON  
[hmaguire@yorku.ca](mailto:hmaguire@yorku.ca)

## **Abstract**

*Earlier this year, Nokia, one of the world's foremost wireless manufacturers, announced a deal with Rogers Communications, one of Canada's largest media conglomerates, to launch its N-Gage phone, which deploys GPS technology, real-time mapping and integrated service and gaming applications over the Rogers high speed wireless network. These Location Based Services (LBS) are a "prime example of the direction that mobility is taking" (Nokia, 2008). Bennett and Crowe (2005), in a report to the Office of the Privacy Commissioner of Canada, address LBS privacy and policy implications, but note that the kind of convergence necessary to arouse concern about the surveillance potential for children, mobile workers and citizens was only just beginning. In three short years, from this report until today, with Nokia's N-Gage, Apple's iPhone, and RIM's Blackberry, the frontier of convergence of mobile technologies, tracking software, organizational systems, standards setting and public policy is upon us. At a time when proponents and critics suggest that LBS technologies are on the brink of ubiquity via integration with cell phones and other hand-held devices, not only is it crucial that academics take up this kind of data mobility, but also that there is a more general public engagement with the social, ethical, and legal dimensions of LBS. There is, in fact, a politics of mobile data.*

*The aim of this paper is to critically engage with the convergence of mobile telephony with location-based services, in order to tease out the complexity of this relationship, and its potential for altering the telecommunications landscape in Canada. Using case studies of two of Canada's largest wireless carriers offering LBS services, Bell Canada and Rogers, I focus on the concept of "mobility" and the simultaneity of fixity and flow. This work not only highlights the politics of mobile data, but also contributes more generally to theorizing mobility within communications studies. Mobility has been taken up extensively within sociology and geography, and while communications has focused on mobile devices, the focus tends to be on the device and the user, rather than on the movement itself. This paper thus helps fill this gap in the literature.*

Stop for a moment and imagine a world where people move from place to place, negotiating airports, cities and wide-open spaces carrying small devices in their pockets that render their locations visible, all the time. It is a world quickly unfolding. That we are increasingly mobile is of little dispute; people move around the globe, staying connected via their mobile communication technologies, with little worry about location. Yet, that mobility is not unfettered. In fact, location itself is pivotal in managing mobility. The recent emergence of Location-Based Services (LBS), which rely upon the convergence of Global Positioning System (GPS) technology with mobile communication devices, is a useful case study in the continued

importance of location in the advent of increasingly mobile societies. They exist somewhere in the tension between the desire to be mobile, and the need to be attached to, and located in specific geographies.

The myth of the “end of geography” in relation to the development of both the Internet and mobile communication technologies abounds (Mosco, 2004). While this myth drives a utopian, globe-shrinking discourse about the power of new technologies, it simultaneously glosses over the continued persistence of the power relations embedded in both physical and virtual space. Connected to the “end of geography” myth is the belief in the determinism of technology, whereby new technologies drive social change and reconfigure both time and space (Robins & Webster, 2002; Castells et al., 2007; Ling & Campbell, 2009). Babe considers the ways in which political economy undoes mythologies, and suggests that technologies are “part and parcel of the struggle for power” (1996: 82, see also Mosco, 1988, Mosco & Foster, 2001). From this position, the allocation, production, consumption and distribution of new technologies emerge within very specific social, cultural, economic and geo-political contexts.

The purpose of this paper is to explore the political economy of Location-based Services, by unmasking the myth of the ‘end of geography’ and arguing that space and location are significant, if not fundamental, to the development of mobile technologies and services. Specifically, I consider the political and economic forces that simultaneously enable and constrain LBS development within the North American market. Throughout, and following Mosco (1988), I position technologies not as simple derivatives or neutral tools of the geo-locative infrastructure. Rather, they are imbued with the beliefs and ideologies of the environment out of which they emerge, and, as such, these Location-Based Services reveal a shift in social relations that requires “constant connection and instant communication” (Deleuze, 1995: 174), while at the same time reaffirming the significance of spatial, locative practice. This paper unfolds by first exploring the intersection of location, mobility and technology, pointing to the nexus of these three elements as a site of power, and demonstrates how political economy can help explore the development of Location-based Services. This section also points to the importance of historical socio-political and economic context. The following two sections trace that history, first through the lens of technological convergence, and then through standardization. Finally, I focus on the flexible organizational practices that have emerged from this history. I draw upon the history of GPS development, wireless E911 services and Rogers Communications’ *mFleet* to illustrate the ways in which geography and location continue to shape and produce technologies and their resulting services.

## **Background: Location, mobility and technology**

Information about location is nothing new. There is a long history of various techniques for marking, demonstrating and otherwise rendering visible our location in the world; we make maps and signposts to denote space and place with impunity (Dawson et al., 2007). Certainly, communication technologies have played an important role in determining and expressing location. More recently, our understanding of location has shifted; as more people are “on the move” with their mobile communication devices, location is less taken-for-granted. For example, where once it was fairly easy to ascertain location based on access to the telephone, now it is nearly impossible to make such assumptions. “Where are you?” is now a common question on a mobile phone (Green, 2002; Ferraris, 2005). That is not to say that mobile technologies have determined movement, but rather their emergence is both indicative of a social shift towards greater mobility and one of its constitutive elements.

Broadly speaking, “mobility” as a conceptual terrain emerged in part to describe the shift from Fordism to Post-Fordism (Webster, 2002: 187; Urry, 2000). Mobility can be understood as the flows of information, people and capital around the globe, along with the everyday practices of moving through public spaces, transportation, and daily communication (CeMoRe, 2009, Urry, 2006). We are, in short, on the move. Key to understanding mobility is the recognition that it is more than just movement, because mobility can never be abstracted from power (Urry, 2000; Cresswell, 2006). Cresswell (2006) and Urry (2000, 2007) argue that mobility is not an abstract concept, but a social and material practice embedded within historical, spatial and political frames.

There is a general sense, though, that mobility is a universal benefit. However, as Massey points out, “some are more in charge of it than others; some initiate flows and movement; some are more on the receiving end of it than others; some are effectively imprisoned by it” (1993: 63, as quoted in Adey, 2006: 83). Adey calls this a differentiation of mobility: “Movement is not a simple thing undertaken only by a few but it is present everywhere and may be experienced in many different ways” (2006: 83). What Adey does not explicitly address, however, is that not only is mobility experienced in different ways, it is also experienced in relation to space. Space is central to our understanding of social practices, including mobility. Lefebvre argues:

Though a product to be used, to be consumed, it is also a means of production, networks of exchange and flows of raw materials and energy fashion space and are determined by it (1991: 85).

Space thus plays a pivotal role in shaping mobility, while at the same time being shaped by it. They are co-constructive. This is an important distinction, because while there has been a great deal of emphasis on mobility, particularly in relation to mobile communication technologies (c.f. Plant, 2002; Ling, 2004; Kavoori & Arceneaux, 2006; Castells et al., 2007), there has been much less concern with the geography of mobile spaces. This is interconnected with location, because location is how we describe, or point to particular spaces. Location is a materiality of the abstract nature of space. In short, location does not disappear; in fact, location plays a pivotal role in the shaping of social relations through the use of mobile devices.

At the same time, a sensibility has emerged which suggests not only that these gadgets facilitate greater freedom and unfettered movement around the globe, but also that such mobility renders geography irrelevant (Castells et al., 2007; Levinson, 2004). It no longer matters where we are, as long as we are still in touch. It is interesting, then, in the mobile age -- an age defined by the ability to sustain communication links whilst on the move -- that the most recent mobile phone designs offer services built upon location: GPS-enabled tracking, on-board mapping, web-based “friend finder” applications, to name a few. This suite of services falls under the umbrella of Location-Based Services (LBS); in Canada, the largest wireless telecommunications companies, including Bell Canada and Rogers Communications, have started to offer a variety of LBS to both corporate and individual customers.

Location-based Services provide an interesting point of entry into unmasking the “end of geography” myth because they bring together elements of mobility, technology and location. Lyon, Mamura and Perpoff provide a helpful working definition of LBS:

[Location-Based Services] are technologies that meet three specific criteria. They can pinpoint locations, they can report these continuously and they can do it in real time. So while RFID (radio frequency identification) and Wi-Fi present related issues, only those services that can give coordinates by calculating the longitude and latitude of a person’s position are the ones considered location technologies in the sense used here. They can point to the exact place where the person is and communicate this in real time to other persons or agencies, on an ongoing uninterrupted basis (2005:6).

LBS are services that exist only at the intersection of mobility, technology and location. They translate location into a series of data packets, collected and communicated using mobile devices, so as to provide information about users as they are situated in particular locations. Academic engagement with LBS has centered most readily upon issues of privacy and

surveillance (c.f. Bennett & Crowe, 2005; Lyon, Mamura and Perpoff, 2005). These reports focus on the implications of LBS use on children, workers, the elderly and prisoners (see also Casal, 2004; Gow, 2005; Joore, 2008). While these projects help to broaden social understanding of LBS, there is less engagement with its technological, economic and political history. As a result, spaces of mobility tend to disappear.

The development of LBS is driven by the co-constructive relationship between new technologies and the society out of which they emerge; that relationship can be understood from a political economy perspective. This approach examines "the social relations, especially the power relations, that mutually constitute the production, distribution and consumption of resources" (Mosco, 1996: 25). Golding and Murdock suggest that the political economy perspective is "interested in the interplay between economic organization and political, social and cultural life" (2000: 73). This wider context is particularly useful for analyses of emergent communication technologies, because by understanding technology not as the driving force of social change, nor as a neutral tool, it overcomes much of the social and technological determinism critiques (Robins & Webster, 2002; Mosco, 1988).

This essay, therefore, works towards a political economy of Location-Based Services, by considering the social and power relations that have contributed to, or inhibited its development in the North American marketplace. Drawing upon material from both the U.S. and Canada, I focus on three realms of LBS development: technological convergence, standardization and flexible organizational responses.

### **Technological Convergence: Hybrids in new frontiers**

LBS are first and foremost about the convergence of technologies: stationary computers and their related networks, satellites and mobile devices. Global Positioning System (GPS) technology transmits location and time information from a minimum of three satellites to the mobile device; the device uses this data to determine location. The cellular phone then uses the wireless infrastructure to transmit location data to the computer, which in turn uses its networks to transmit that data across various Internet platforms. The novelty with LBS is that it is only very recently that mobile devices have become GPS receivers, thus completing the circuit of real-time data transmission.

Central to the workings of LBS systems is GPS technology. Until recently, location was determined on cellular phones by a process of triangulation between cell towers (Smith, 2003). In metropolitan areas, where market competition is stiff and the wireless industry works to offer the most up-to-date services, triangulation can be quite effective. However, in rural areas, where

cell towers are far apart, where coverage is scant, or where the natural environment imposes, its effectiveness is reduced significantly.

That changed when the GPS infrastructure led to a greater opportunity for precise location through satellite information gathering. A brief history of the GPS helps to underscore the significance of this change. The GPS is a system of 24 NAVSTAR satellites orbiting 20,000 km from earth, positioned such that wherever you stand on the earth's surface, you are within sight of six satellites (U.S. Dept. of Homeland Security, 2009). This system is owned, developed and controlled by the U.S. Department of Defense and is used around the globe for location and time-based information.<sup>2</sup> From its inception in 1993, data specific to latitude, longitude, time and altitude has been continuously streamed from outer space. ("Beyond Discovery," 2009). Like the Internet itself, GPS was designed for military logistics, and has since spread to use within the public domain. Ownership of international communications networks has been traced to imperial and colonial projects, where the "fight for airwaves" is paramount for sustaining power (Thussu, 2000)<sup>3</sup>.

With its connection to military applications, GPS worked under a process of Selective Availability (SA) whereby there was one level of precision available to the military, and another level available to the general public (KWARC on-line, 2000). This stratification of availability of information was in place to protect (American) military maneuvers and activities by providing them a greater degree of targeting precision than that available to an enemy. However, the SA protocol was turned off on May 1, 2000. Dr. Neal Lane, Director of the U.S. Office of Science and Technology announced:

In plain English, we are unscrambling the GPS signal. It's rare that someone can press a button and make something you own instantly more valuable, but that's exactly what's going to happen today. All the people who bought a GPS receiver for a boat or a car, or their riding lawn mower or whatever, to use in business and in recreation, are going to find that they're suddenly 10 times more accurate as of midnight tonight (KWARC On-Line, 2000).

---

<sup>2</sup> Of note, the EU has made efforts to build its own variation of satellite positioning technologies under the Galileo name, as has Russia with GLONASS. Galileo has yet to be implemented, and GLONASS fell into disrepair with the economic collapse of the USSR.

<sup>3</sup> See Thussu (2000) for an in-depth analysis, particularly his discussion of the ITU where he explores the power dynamics of ownership of international communications networks.

In terms of convergence, this timing is significant, because it occurred during the same time period that cellular phones were reaching the point of ubiquity in North America, rapidly doubling penetration rates on a yearly basis (CWTA, 2009). Moreover, it was during this same time period that Internet-based mapping applications such as MapQuest.com began to take hold as a location-aware tool.<sup>4</sup> Although it would take several years for this convergence to take place, the seeds were planted in 2000, when Clinton turned off the SA protocol, and thereby enabled massively precise data integration through GPS systems.

When the Clinton administration announced its 1996 Policy on GPS, it recognized the military history of GPS development, but pointed to a “dual purpose” model that includes a democratic purpose. Directive 1 states, “We will continue to provide the GPS Standard Positioning Service for peaceful civil, commercial and scientific use on a continuous, worldwide basis, free of direct user fees” (“Fact Sheet,” 1996). The White House continues to support the directives set out in 1996 (updated in 2004). Policy statements point to the democratic, peaceful use of satellite-based positioning, but it is underscored by the realization that the entirety of the world’s information regarding satellite-based, geo-locative positioning is dependent upon the directive of one nation-state. There is no international committee of governance in place.

The convergence of GPS, mobile technologies and Internet mapping is a recent phenomenon. In 2005, Bennett and Crowe argued that:

This ... potential requires a further convergence of technology, standards-setting and organizational interests to produce what has come to be called, “location-based services”... That convergence has begun, but it is [by] no means complete (2005: 9).

Yet, in 2007/2008, just three years later, Nokia, RIM and Apple all released devices that supported on-board GPS receivers and Internet-based mapping software. Moreover, as early as 2005, Canada’s largest wireless carriers, Bell Canada and Rogers Communications began offering a series of Location-based Services for businesses and individuals. One example is Rogers’ *mFleet*, which manages the data produced by GPS-enabled mobile devices transmitted over the Rogers network and supported through third party data management applications.

---

<sup>4</sup> In 1999, MapQuest.com went public, and was purchased by AOL in 2000. It quickly became the key source of information for public map access. Its mapping data comes from Navteq, the company that provides mapping data to Google Maps.

These hybrid Location-Based Services, emerging from the convergence of GPS, cellular and wi-fi networks, demonstrate the importance of location in relation to mobility. These services are driven by their ability to provide location-specific information in real time. The implications for this kind of convergence are twofold. First, location is reinscribed into the landscape of mobility whereby the data produced from GPS renders visible location in real time. While the person who is mobile is entirely aware of their location, the perspective has shifted for organizations, whereby they now have access to information about location that had been previously unattainable. As Hemmett states, the “convergence of geographic and data space [is] ’putting a sense of place back into cyberspace’” (2005: 34). This is important because it points to the ways in which the myth of the “end of geography” unravels under the scrutiny of convergence.

Second, it calls into question the ways in which power is allocated in mobile networks. Is it a case of what Taras refers to as “old media reproducing and perpetuating their power” (2001: 66) through concentrated surveillance methods, increased connectivity and real-time geo-locative information access? Or, is this convergence equipping individuals with a broader, more accurate set of communication technologies to assist them in navigating through an increasingly mobile world? Researchers are beginning to consider the implications for privacy and surveillance (Bennett & Crowe, 2005; Lyon, Mamura & Perpoff, 2005), but this work is just beginning.

The convergence of technologies that has enabled the emergence of LBS demonstrates the significance of geo-location in relation to mobility. Through rendering location visible using mapping applications, real-time data transmission and a broad array of internet-based services, rationality and ordering are restored. The next section attends to the inter-related concept of standardization, whereby through standards-setting processes, location becomes increasingly regulated and controlled.

### **Standardization: E911 and the tension between regulatory measures**

The struggles for standardization can be explored through an analysis of Wireless Enhanced 911 (herein “wireless E911”) service – a location-based service in the process of becoming standardized across North America that has been crucial in driving both the mandate of, and demand for GPS-enabled mobile devices. In times of need, the availability of location data is essential to timely provision of crucial lifesaving services. Moreover, I focus on the regulation of one component of the LBS suite, so as to explore the tension between market and government regulation. Mosco (1996) argues that there is no such thing as an unregulated market; regulation can occur from either market or state level, or a combination of the two.

The North American 9-1-1 system has been in existence since the 1960s, using Public Service Answering Points (PSAPs) to redirect emergency calls to fire, ambulance and police, based upon the availability of phone numbers attached to specific locations (Gow, 2005; Dawson, 2007). By the early 1990s, emergency responders were able to dispatch services to the location where the call was made via caller ID technology without having to ascertain the location verbally during a call. In the mid-1990s, the advent of mobile phone technology undermined and threatened this capability. Gow explains:

Put simply, mobile phones present a problem for emergency services because it is difficult, perhaps impossible in some cases, to determine the precise location of callers in distress when they are unable to provide such information orally to the dispatch operator (2005: 77).

Location, previously a known component of E911 access, was now central to the problem. Moreover, it led to a push and pull between the wireless industry and the state over standardization protocols. Some elaboration on this history of debate helps to tease out the political and economic struggles surrounding wireless E911 standardization.

In 1996, the Federal Communications Commission (FCC) in the U.S. mandated that all wireless carriers must implement the mobile equivalent of automatically location-determinate E911 access throughout the United States. In Canada, the service has struggled because E911 has fallen under provincial jurisdiction (Lyon et al., 2005). In February, 2009, the Canadian Radio-television and Telecommunications Commission (CRTC) announced that wireless carriers have one year to implement wireless E911 access in Canada (“CRTC announces enhancements,” 2009). This pressure resulted in part from the convergence of wireless technologies and GPS, whereby the ability to precisely locate a cell phone user has been heightened due to more precise GPS data that complements the existing triangulation from cell towers.

However, while state regulation pushed towards standardization of wireless E911 access across both the U.S. and Canada, industry resisted early implementation of these protocols. Wireless trade publications reported on the level of uncertainty about wireless E911 implementation. This uncertainty emerged out of questions about related networking issues, costs and profitability (Rockwell, 2003). After 9/11, when 9-1-1 PSAPs were jammed, the wireless carriers were called into question by regulators for their unwillingness to adhere to FCC mandates (“Wireless carriers,” 2001). At the heart

of this reluctance was a market-driven value system that privileged profit over perceived safety.

However, in the post-9/11 economy, there was a shift towards corporate responsibility, as a result of market rather than state regulation. This came from two sources. The first was the recognition that, post-9/11, corporations should be attentive to the increased desire for safety. As one U.S. senator states, “Wouldn't it be the best (public relations) for the wireless companies to put this on the front burner and really make it happen?” (“Wireless carriers,” 2001). This senator, mobilizing the discourses of safety and responsibility, points to the “public relations” aspect of these projects, thereby linking market acceptance and profitability to safety. Put another way, “good companies” will upgrade their services immediately, in the wake of 9/11, and consumers will support these responsible companies, thereby increasing profits and avoiding state-enforced regulation.

The second was the suggestion that perhaps there was money to be made through these LBS. Wireless telecom businesses recognized that while the implementation of the E911 protocols was expensive due to the sheer cost of technology upgrades, there were ways to capitalize upon these costs and open up new markets. However, the path to profitability was not self-evident. One marketing expert commented that, “A lot of the carriers feel the business case for E911-based commerce services is not clear. They haven't rushed (to adopt it) [...] Will you make money (in E911)? Yes. But the cost of building the network is not trivial” (“Wireless carriers,” 2001). Moreover, wireless industry experts were troubled by issues of privacy and surveillance in relation to corporate liability. One industry spokesperson said, “Privacy is a huge issue when not handled properly,” (Zane, 2001: 1). In this way, the volatility of the market was dependent upon LBS-related issues that might have otherwise been considered “social issues,” yet they were reduced to market measures of efficiency and profitability.

The wireless E911 standardization is an interesting case to examine because it shows the tension between state and market regulation that emerged during extraordinary times in North America. The discourses of fear and safety are culturally driven motivations that contributed to the formation of the wireless E911 network. At the same time, technological convergence, which enabled accurate location, and market regulation based upon profit and business potential further shaped its development. The historical context and the ensuing results cannot be downplayed. While E911 allows wireless users to be tightly managed, the public face of the mandate is one of safety and rescue that is

born out of fear. Wireless industry response, while somewhat uncertain, tended to lean towards regulation based upon market principles. Moreover, if the wireless industry appeared to be implementing the provisions of the FCC mandate on its own, it could avoid further regulation by the state.

It is interesting to note that the E911 infrastructure development focuses mainly on the relationship between the wireless industry and government bodies (FCC and CRTC), leaving the individual users strangely absent from the discussion. This is significant, as these individuals are consistently mobilized as those in need of the surveillance and safety associated with being located (Gow, 2005; Bennett and Crowe, 2005; Lyon et al., 2005). Moreover, at the heart of the E911 protocol is an acute awareness of location. The purpose of wireless E911 is to locate someone within 10 – 100 metres of their actual place, through satellite trilateration or cell phone tower triangulation and make that location available to the carrier and emergency responders. One of the interesting ideas emerging from the history of wireless E911 standardization is that industry realized the market potential. The next section examines *mFleet*, an LBS system developed by Rogers Communications in Canada, and explores the development and expansion of a new market.

### **Flexible Organizational Responses to Mobility**

This final section considers the flexible organizational responses to mobility through a case study of *mFleet*, Rogers Communications' LBS suite for managing mobile fleets and labour. Having established the complex set of converging technologies at play, and its historical socio-political and economic context, and then having explored the tension between market and state regulation in terms of LBS development, there is a significant need to consider what the material outcomes of these shifts have been. In the preceding section, wireless industry trade publications revealed a willingness to engage with Location-based Services, provided that there was a potential for profit generation and capital accumulation. Services such as *mFleet* were still very much being imagined in 2001. Within six years, the materiality of this vision is upon us.

Harvey (1989) sees mobility as an integral component of the economic structure in the post-Fordist era (see also Urry, 2006; Webster, 2002). In part due to levels of connectivity and instantaneous communication available through digital communication networks, the flexible accumulation processes of capitalism depend on a more mobile, flexible workforce. Harvey argues that, "capitalism is becoming ever more tightly organized through dispersal, geographical mobility, and flexible responses to labour markets, labour processes, and consumer markets, all

accompanied by hefty doses of institutional, product, and technological innovation” (1989: 159). At the nexus, innovation, markets and labour all contribute to finding new spaces for the creation of capital. In this sense, location still matters; the myth of the ‘end of geography’ further unfolds. Harvey states,

Flexible accumulation typically exploits a wide range of seemingly contingent geographical circumstances, and reconstitutes them as structured internal element of its own encompassing logic. For example, geographical differentiations in the mode and strengths of labour control together with variations in the quality as well as the quantity of labour assume a much greater significance in corporate locational strategies (1989: 294).

The contingency of the flows of people, information, goods and capital around the globe, coupled with the localized practices of transportation and communication point to a fluid and flexible kind of mobility that build upon the logic and apparatuses of flexible accumulation.

Since 2007, Rogers Communication has been offering its *mFleet* services for businesses seeking to manage their increasingly mobile fleet and workforce. Partnering with a third party software company, Rogers began offering LBS specific to industry, thus leading the way, in Canada, in this kind of industrial application and support. Their press release states:

*mFleet* offers fleet managers and operators real-time automated vehicle mapping, intelligent management reporting, and vehicle diagnostic (health) reports. Using *mFleet's* Locator hardware with Global Positioning System (GPS) and engine diagnostic technology, messages from vehicles connect in real-time to *mFleet* Quadrant, a secure, Web-based hosted mapping and reporting software, over the Rogers Wireless network (“Rogers introduces mFleet,” 2007).

Rogers positions the economic benefits of flexible management through LBS, whereby a more monitored fleet is a more efficient one. Innovative technology, real-time communication and constant connection underscore the viability and applicability of the set of services. According to their website:

- \* How do you ensure that your fuel costs and overtime are work-related and that you reward the right driver behaviour?
- \* Can you quickly locate where your personnel are to route them efficiently to the next job or send out emergency support?

- \* Are you able to provide your customers with verification of delivery times and site visits?
- \* Would you realize insurance savings through geofence alerts for your valuable equipment?
- \* Do you have engine diagnostic data to minimize both your maintenance downtime and carbon emissions? (“mFleet: The smart way,” 2009).

Noticeable here is the focus on location; *mFleet* is centrally concerned with making visible the location of fleet, workers and goods as they are mobile, pinpointing their location in relation to time, organizing and controlling the movement of flexible workers across geographically dispersed areas and managing the realities of that which has become so problematic in terms of managing mobility (Packer, 2003 & 2008).

LBS services are market driven, and packaged as services to manage mobility, thereby saving time, cutting production and distribution costs, and generating more capital. Once again, concern for the worker becomes conflated with management of labour as a resource, hinging on concern for liability and efficiency. Indeed, the marketing of *mFleet* reinforces the tensions of mobility: “Gain control. Stay connected. Increase sales. Find your way” (“Do more,” 2009). All of these tag lines point to location – control over location through staying connected; every aspect of that control is reduced to market efficiency.

*mFleet*, as a material product of convergence, standardization and flexible accumulation, was developed out of two key ideas: profitability, in that there is money to be made by making location visible, and liability, where these LBS make fleet and labour management safer. Nobody gets lost; nobody breaks speed limits. Every aspect is managed and controlled. Control is based entirely upon the visibility of labour and fleet in location. Moreover, human error is further reduced. Logic, rationality and efficiency are reinscribed onto business models that espouse flexibility, creativity and change as key aspects of survival in the post-Fordist economic model. This irony is not lost on Harvey, and is in fact the central argument that he makes. In the end, the logic of capitalism reincorporates all in its path.

### **Conclusions: Power and unmasking the ‘end of geography’ myth**

Cresswell (2006) argues that mobility without control is problematic, “mobility has been the object of fear and suspicion, a human practice that threatens to undo many of the achievements of modern rationality and ordering” (2006: 20, see also Packer, 2008). To the extent that mobility is considered a “social problem” (Cresswell, 2006,

Packer, 2008), location helps to manage it. At the same time, we have seen that location is itself subjected to relations of power. The GPS, for example, is the only system of its kind in the world, owned and born out of the U.S. military, entirely contingent on a U.S. government policy for availability. Clinton effortlessly turned off the SA protocols, thereby making everyone's GPS technologies much more valuable; a corresponding diminution of utility is always possible. The struggle between market regulation and state regulation in the standardization of wireless E911 protocols further demonstrates the wrestling for control and therefore power of a technological system. Finally, the case study of *mFleet*, which rounded out this paper, helps to show the material reality of these early struggles, and demonstrate what values are being privileged in LBS development within industry. Location matters.

In many ways, this has been a historical project because it traces the history of the technological convergence and struggle over standardization out of which Location-based Services have emerged. However, it has also done the work, located within political economy, of unmasking one of the myths that has arisen out of the utopian discourse of digitalization: the "end of geography" myth. What this paper has shown is that when mobility is on the rise - when people, information and capital are "on the move" - geo-location is a fundamental part of apparatus of mobility. It is fundamental because it tames movement by rendering movement fixed, albeit momentarily, in very specific spatial and temporal boundaries.

Notably, this paper has not grappled with the potential for ownership concentration that is possible with technological convergence. Nor has it attended to the ways that labour is managed, beyond raising questions about the potential for the privacy-breaches by corporations and the state. While some work has addressed these issues within sociology and cultural studies, it is important that political economy engages with them as well, particularly with the potential to illuminate inequalities in new mobile communication networks. Further research that takes up ownership, labour and regulation would be helpful.

The tensions between mobility and relative immobility are rendered visible with the advent of LBS, in that for every movement, there is an equal opportunity to track it. Neatly packaged and sold as safety devices, mobile bodies carrying GPS-enabled communication technologies are increasingly surveilled, transformed into data and sold back for market aggregation and business management purposes. My sense is that there is a lived reality to these processes that requires further exploration.

## Works Cited

- “Beyond Discovery.” (2009). *The Global Positioning System: Role of Atomic Clocks*. Accessed 1 March 2009. <http://www.beyonddiscovery.org/content/view.page.asp?I=1275>
- “CRTC announces enhancements to 911 service.” (2009). Canadian Radio-television and Telecommunications Commission website. Accessed 10 March 2009. <http://www.crtc.gc.ca/eng/NEWS/RELEASES/2009/r090202.htm>
- “Do more with wireless business applications.” (2009). Rogers Communication website accessed 2 Mar 2009. <http://www.your.rogers.com/business/productservices/wireless/mobile/businessapps/index.asp>
- “Fact Sheet.” (1996). *U.S. Global Positioning System Policy*. Office of Science and Technology Policy, National Security Council, The White House. [http://gauss.gge.unb.ca/policy/Fact\\_Sheet](http://gauss.gge.unb.ca/policy/Fact_Sheet).
- “mFleet: the smart way to manage your vehicles, personnel and equipment.” (2009). Rogers Communications website. Accessed 2 Mar 2009. <http://www.your.rogers.com/business/productservices/wireless/mobile/fleetsolutions.asp>
- “Rogers introduces mFleet.” (2007). CNW Group. Website accessed 1 Mar 2009. <http://www.newswire.ca/en/releases/archive/April2007/12/c4157.html>
- “Wireless carriers are behind E911 Curve.” (2001). *Wireless Insider*. 2 (35). Pg. 2.
- Adey, P. (2006). If mobility is everything then it is nothing: Towards a relational politics of (im)mobilities. *Mobilities*, 1 (1). Pp. 75-94.
- Casal, C.R. (2004). Impact of location-aware services on the privacy/security balance *Info : the Journal of Policy, Regulation and Strategy for Telecommunications*. 6 (2). Pp. 105 – 111.

- Castells, M. (1996). *The Rise of the Network Society*. Cambridge, MA: Blackwell.
- Castells, M., M. Fernandez-Ardevol, J. Linchuan Qui and A. Sey. (2007). *Mobile Communication and Society*. Cambridge, MIT Press.
- CeMoRe. (2008). The Centre for Mobilities Research homepage. Accessed 2 September 2008. <http://www.lanacs.ac.uk/fass/centres/cemore/>.
- Cresswell, T. (2006). *On the Move: Mobility in the modern Western world*. New York, London: Routledge.
- CWTA. (2009). *Canadian Wireless Telecommunications Association*. Website accessed 10 February 2009. <http://www.cwta.ca>.
- Dawson, M., Winterbottom, J. & Thomson, M. (2007). *IP Location*. New York: McGraw-Hill.
- Deleuze, G. (1995). *Negotiations: 1972-1990*. M. Joughin, (Trans.). New York: Columbia University Press.
- Ferraris, M. (2005). *Where Are You? Mobile Ontology*. Paper delivered at the Seeing, Understanding, Learning in the Mobile Age conference, 29 April 2005, Budapest, Hungary. <http://www.fil.hu/mobil/2005/Ferraris.pdf>.
- Golding, P., & Murdock, G. (2000). Culture, communications and political economy. In *Mass media and society* (3rd ed.) J. Curran, & M. Gurevitch (Eds). London; New York: Arnold; Oxford University Press.
- Gow, G. (2005). Information privacy and mobile phones. *Convergence: International Journal of Research Into New Media Technologies*. 11 (2). Pp. 76 – 87.
- Green, Nicola. (2002). 'Who's watching whom? Monitoring and accountability in mobile relations.' In *Wireless world*. B. Brown, N. Green and R. Harper (Eds.). London: Springer.

- Harvey, D. (1989). *The condition of postmodernity*. Oxford, Cambridge: Blackwell.
- Hemmett, D. (2005). The Mobile Effect. *Convergence: International journal of research into new media technologies*. 33 (2). Pp. 32 – 40.
- Joore, P. (2008). Social aspects of location-monitoring systems: the case of Guide Me and of My-SOS. *Social Science Information*. 47. Pp. 253-274.
- Kavoori, A. and Arceneaux, N. (2006). *The Cell Phone Reader: Essays in social transformation*. New York: Peter Lang Publishing.
- KWARC On-Line. (2000). “GPS SA Set to Zero”. Accessed 13 March 2009. <http://www.kwarc.org/sa-off.html>
- Lefebvre, H. (1991). *The Production of Space*. D. Nicholson-Smith (Trans.). Oxford: Blackwell Publishing.
- Levinson, P. (2004). *Cellphone: The story of the world's most mobile medium and how it has transformed everything!* New York: Palgrave MacMillan.
- Ling, R. (2004). *The Mobile Connection: The cell phone's impact on society*. San Francisco: Morgan Kaufmann Publishing.
- Ling, R. and S.W. Campbell (Eds.). (2009). *The reconstruction of space and time: Mobile Communication Practices*. New Brunswick, London: Transaction Publishers.
- Lyon, D., S. Marmura & P. Peroff. (2005) Location Technologies: Mobility, Surveillance and Privacy: A Report to the Office of the Privacy Commissioner of Canada under the Contributions Program. *The Surveillance Project*, Queen's University, Kingston, ON. Available at: <http://www.queensu.ca/sociology/Surveillance>.
- Mosco, V. (2004). *The digital sublime: Myth, power, and cyberspace*. Cambridge, MA: MIT Press.

- (1996). *The Political Economy of Communication: Rethinking and Renewal*. London: Sage Publications.
- (1988). Introduction. In *The Political Economy of Information*, Mosco, V. and J. Wasco. (Eds.) Madison, WI: University of Wisconsin Press.
- Mosco, V. and D. Foster. (2001). Cyberspace and the end of politics. *Journal of Communication Inquiry*. 25 (3). Pp. 218 – 236.
- Packer, J. (2008). *Mobility without mayhem: Safety, cars, citizenship*. Durham, NC: Duke University Press.
- (2003). Disciplining mobility: Governing and safety. In *Foucault, Cultural Studies and Governmentality*. Z. Braitich, J. Packer & C. McCarthy (Eds.). Albany: SUNY Press.
- Plant, S. (2002). *On the mobile: The effects of mobile telephones on social and individual life*. Motorola website accessed 16 June 2006. [www.motorola.com](http://www.motorola.com).
- Robins, K. and F. Webster. (2002). *The Long History of the Information Revolution*. In *Information Society Reader*, F. Webster, (Ed.). London and New York: Routledge.
- Rockwell, M. (2003). E911: The devil is in the details. *Wireless Week*. Vol. 19 (11). P. 20.
- Smith, A. (2003). Cell-tower triangulation: a workable strategy to improve wireless phones' 9-1-1 access. *New Media Journalism, Faculty of Information and Media Studies*. University of Waterloo. Accessed 13 March 2009. [http://www.fims.uwo.ca/newmedia/newmedia2004/cell/Cell\\_Smith/cell\\_smith\\_triangulation\\_n28\\_p.htm](http://www.fims.uwo.ca/newmedia/newmedia2004/cell/Cell_Smith/cell_smith_triangulation_n28_p.htm).
- Taras, D. (2001). *Power & Betrayal in the Canadian Media*. Peterborough: Broadview Press.
- Thussu, D.K. (2000). *International Communication: Continuity and Change*. New York: Oxford University Press.

Urry, J. (2007). *Mobilities*. Cambridge: Polity Press.

----- (2000). Mobile Sociology. *British Journal of Sociology*. 51 (1). Pp. 185-203.

U.S. Department of Homeland Security. (2009). *What is GPS?* Website accessed 26 February 2009. <http://www.navcen.uscg.gov/gps/GPSfaq.htm>

Webster, F. (2002). *Introduction: Transformations*. In *Information Society Reader*, F. Webster, (Ed.). London and New York: Routledge.

Zane, R.S. (2001). Can Location-based services shake paranoia bug? *Wireless Insider*. 26 March 2001. Pg. 1.