From CCTV to Biometrics through Mobile Surveillance

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INTRODUCTION

Surveillance is the act or process of observing, tracking, or recording personal details for the purpose of exercising control over the individual or population being watched. Control in this context can mean many things, from directly influencing the behavior of the observed to the use of gathered information for the purpose of management or governance.

Mobile surveillance can be defined as two distinct, yet related, practices. The first is the ability to observe the physical movement of an individual through space. This is most often accomplished through documenting their interaction with a surveillance network. The object of surveillance is tracked from one node of the network to another, providing a record of behavior. The second practice is often referred to as dataveillance, or the ability to monitor an individual's behavior through studying a trail of personally identifiable data, including credit card purchases, mobile phone calls, and health records.

Mobile surveillance employs an array of technologies including video and photography cameras, visual recognition software, radio frequency identification (RFID), global positioning receivers (GPS), information and communication technologies (ICTs), and biometrics. Examples of mobile surveillance networks include the dense deployment of closed-circuit television (CCTV), video, and photographic technologies in a distinct geographic space to monitor activity, the tracking of automobiles and mobile phones via GPS, and radio frequency sensing that records motion as identity chips pass through a distributed network of receivers. As these networks proliferate, individuals are the exposed to overlapping layers of surveillance. Although many of these surveillance networks are deployed for limited purposes, the increasing ability to save and store personally identifiable information in searchable databases, and the ability to mine information from multiple sources raises privacy concerns for the individual. This is especially true in advanced capitalist societies that rely on sophisticated data gathering to track, model, and predict consumer behavior, as well as for citizen management.

BACKGROUND: SURVEILLANCE, BUREAUCRACY, AND THE STATE

Surveillance has been an integral part of human social interaction since the need for oversight and management of collective endeavors was first realized. As the scope and complexity of these endeavors grew, the need for more reliable information increased accordingly. Surveillance has long been an important method for dealing with risk (Lyon, 1994, 2002, 2003a, 2003b), as the advanced knowledge of aberrant behavior can help minimize the threat or upheaval caused by the unusual events or actions. Therefore, surveillance is often a positive feature of governance, allowing those in power to manage against risk in order to protect public welfare. Nevertheless, surveillance regimes are also employed by the state out of a "desire to more completely manage populations (Lyon, 2003b, p. 20)," identifying and sorting out individuals who's behavior is deemed threatening to the majority. It is of little surprise that the fields of law enforcement and national security and intelligence gathering are the sites of some of the most sophisticated surveillance practices as well as the targets of social concern over privacy and the power of the state.

In *Discipline and Punish*, Foucault (1977) examines the rise of the surveillance society by utilizing Jeremy Bentham's Panopticon prison as a model for the exercise of power in modern society. The architecture of the Panopticon exerts power over the incarcerated body by making it constantly visible to an invisible central observer. The prospect of persistent observation is used to ensure compliance with the disciplinary rules of the institution, therefore making the simple awareness of surveillance a means of exerting power over the watched individual.

Foucault (1977) notes the historic extension of surveillance architecture from the prison to other social institutions such as schools, hospitals, mental institutions, and the workplace, which increasingly relied on the specter of persistent observation in order to exert control over their subjects. In addition to the direct surveillance enabled by panoptic architecture, the rise of bureaucratic

organizations, especially in the West, lead to an institutionalization of mechanisms for the capture, retention, and processing of personally identifiable data.

The direct and indirect surveillance employed by public libraries in Victorian Britain (Black, 2001) serves as a historical example of this phenomenon. Libraries have been at the forefront of efforts to manage, catalogue, and retrieve information since the sorting, and storing of information is central to their mission. To this end, libraries have employed increasingly sophisticated surveillance mechanisms to track, record, and monitor the habits of their users and their interaction with the library's collections. While the hierarchical systems of knowledge and the tracking of library users' habits employed in Victorian libraries did not necessarily originate as a means of coercive control but often as an effort to provide enhanced service, their existence often placed the librarian in a position of social power over those observed (Black, 2001, p. 74).

Surveillance is a central feature of the rational bureaucratic organization in modern society, and the explosion of surveillance is intertwined with the historical development and growth of bureaucratic organizations (Beniger, 1986; Dandeker, 1990; Foucault, 1977; Giddens, 1987; Lyon, 1994; Weber, 1968). Dandeker describes the symbiotic relationship between capitalist organizations and the modern state, declaring that their activities are focused on both the internal exigencies of managing a system of administrative control over subject populations and the problems attendant upon monitoring and managing external relations with other organizations. This theme has been central in providing a framework in terms of which the growth of bureaucratic surveillance in modern societies can be explained. (p. 195)

In *Control Revolution*, Beniger (1986) writes that "bureaucratic organization serves as the generalized means to control all large social systems, tending to develop whenever collective activities need to be coordinated toward some explicit and impersonal goal, that is, to be controlled" (p. 390). As the complexity of operations required to control the functioning of a bureaucratic organization increases, so to does the need for advanced technologies to manage information throughput (Beniger, 1986, p. 424). Historically, bureaucratic organizations have utilized technological advances to exert control over the volume of information vital to the functioning of their operation, often to automate data gathering, record keeping, and record retrieval.

Dandeker (1990, p. 40) provides an excellent four point schema for evaluating the surveillance capacity of organizations. This model evaluates the size of the files held in a surveillance system, the centralization of those files, the speed of information flows, and the points of contact between the system and its subject population. The escalating use of automated surveillance technologies, sorting software, and searchable computer databases has lead to increases in all four of these areas and has greatly enhanced the surveillance capacity of organizations, making the practice of mobile surveillance possible. The ability of organizations to utilize information and computer technologies in order to search and cross-reference personally identifiable information from a variety of independently established databases has greatly expanded the scope of their surveillance, and has enabled the tracking of individual through digital data profiles compiled from records stored in computer databases.

MOBILE SURVEILLANCE

As social relationships have become more fluid and individual mobility increases, surveillance technologies have developed to keep up with the mobile subject. They are increasingly capable of tracking subjects on the move, and across various media, and through a variety of environments, casting a continual and inescapable gaze upon their subject (Lyon, 2003b). This is accomplished in a variety of ways. Perhaps the surveillance regime that most clearly illustrates the capabilities of mobile surveillance, and embodies the extension of Foucault's panopticism into society at large is CCTV. A CCTV system consists of a network of cameras that provide optical surveillance of a specific geographic area and transmits the visual data to a central location for analysis.

CCTV is most often employed by law enforcement in high-crime areas as a method for identifying criminal behavior, as well as a deterrent factor. Additionally, Norris and Armstrong (pp. 43-51) note the use of CCTV surveillance in residential areas, schools, banks, shops, workplaces, hospitals, schools, and train stations, as well as to regulate automobile traffic and police football stadia. The ubiquity of CCTV in Britain has lead to authors to conjecture that for a British urban dweller it is nearly impossible to move through public and, to some extent, private space without being photographed and recorded (Norris & Armstrong, 1999, p. 2). Increasingly these systems are being automated to work with face recognition software to look for "known" individuals and track their movement from camera to camera throughout the network.

While CCTV surveillance is directly concerned with the local observation of movement, the rise of dataveillance is critical for the observation of what Lyon refers to as "disappearing bodies" (Lyon, 2002). As transactions occur over longer distances, often with the aid of information and communication technologies, the physical body "disappears" and is replaced with personally identifiable data that represents the individual (Gandy, 1993). Mecha-