

Assessing CCTV as an effective safety and management tool for crime-solving, prevention and reduction

Prepared by Vivien Carli

Montreal, December 2008

COMPARATIVE ANALYSIS REPORT



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Abstract

The implementation and use of video surveillance (Closed Circuit Television technology) in societies across the globe has stimulated major debate on a handful of topics. This report aims to surface and synthesize those issues through an investigative and comparative analysis. The report will provide the reader with a variety of discussions, based on an objective analysis of available publications throughout the world. It addresses the history of CCTV and the main debates surrounding effectiveness and utility, it further evaluates the concept of the rise of surveillance societies and the protection of individual rights, and promotes further discussion and analysis through policy recommendations.

I. What is CCTV? Understanding its multi-faceted traits

Surveillance, as a concept and management tool, is described by several sociologists and criminologists, like Clive Norris and Gary Armstrong (1999), as the “elementary building block of all human societies, a form of power” (p.85), representative of the development of technology. Surveillance can be both public and private. One of the most common forms is video surveillance, otherwise known as Closed Circuit Television or CCTV¹. Video surveillance is a technology system of surveillance by cameras, which can be set up and used by public authorities on public places for crime prevention and/or crime prosecution. It is a multifunctional technology, initially used to manage risk in cases of traffic jams, fire, accidents and crime (Hempel & Töpfer 2002). The system consists of video cameras connected in a closed circuit television. Images are sent to a central television monitor or recorded in a control room (European Commission for Democracy Through Law 2007).

Video surveillance is not an isolated concept

There are several ways to discuss CCTV systems, in terms of its use and effectiveness. Such a discussion requires a complex analysis of the types of surveillance as well as the agendas that lie behind implementation and operation. For example, video surveillance can be ‘overt’ or ‘covert’ and used for alternative means: to discourage potential offenders, for the police to gather images to build files or for evidence at court (Leman-Langlois 2003). Video surveillance is not an isolated concept, but encompasses several facets. Francisco Klauser (2004) considers ‘preservative’ and ‘protective’ video surveillance, whereby preservative suggests that preservation of public order and prevention of anti-social behaviour, while protective refers to protection of risk in specific areas or the creation of ‘risk-free’ public spaces. Klauser claims that video surveillance is about socio-spatial relationships. Therefore, preservative and protective video surveillance are two separate methods with differing agendas under the same socio-spatial framework.

Video surveillance systems can be used in either public or private spaces. However, surveillance in public spaces greatly differentiates from that in private spaces. The European Commission for Democracy through Law (2007) explains the difference: “in the public space, individuals expect a lesser degree of privacy, yet they should not expect to be deprived of their rights and freedoms in

¹ It is important to note the differentiation between a closed system and an open system: closed system suggests ‘watching retrospectively’, while open system refers to images on the camera as viewed in ‘real’ time.

their own private sphere and image” (p.101). The private sphere is considered ‘untouchable’ and cannot be subject to unwarranted intrusion. In this case, the location of CCTV systems requires public consultation and an understanding of notions of individual freedoms and rights.

The inevitable and **continuous changing face of CCTV technology** suggests that surveillance is in a constant state of flux, in terms of technical features, the public’s reaction, its use and management by authorities, and the nature of security. CCTV systems are increasingly used for varied purposes and places, which Jean Ruegg, Valérie November and Francisco Klauser (2004) suggest is due to the rise in the number of possible applications of video surveillance. CCTV systems have expanded to facial recognition systems, infrared devices, computerised databases to track people, recording of sounds and voices (microphones), automated license plate identification, cellular alarm communication, roving video surveillance, unmanned aerial vehicles and wireless high-speed computer networks that transfer images at faster rates and improved quality.

Facial recognition technology is a computer application for automatically identifying or verifying a person from a digital image or video frame from a video source. It was first implemented in 1998 in the London Borough of Newham. The technology has expanded to other countries and is currently being used by the German Federal Police, Australian Customs Service and the US State Department (ex. Pennsylvania Justice Network). Currently, there is available software that translates facial features into simple mathematical formulas that can be checked against data banks at a faster pace as well as recognize 3D images (Leman-Langlois 2003). In 2002, the United States Parks Service installed face recognition software on the computer video surveillance cameras at the Statue of Liberty and Ellis Island. At the same time, the Australia’s Sydney International Airport installed SmartGate, which is an automated border crossing system for scanning crew members’ faces that confirms images with passports. Another example is found in 2003, whereby the Royal Palm Middle School in Phoenix, Arizona installed face recognition video surveillance as a pilot program for tracking missing children and registering sex offenders.

Sound Location Technology refers to the integration of sound location to video systems, such as linking gunshots to facial recognition. This technology has been made possible due to impressive amounts of investment by the United States military in security surveillance technology (contributed to improvements in motion analysis, radar detection and light amplification) as well as the expansion of global private security firms. While sound technology is popular, there has been much controversy over the implementation of voice location technology through microphones in public places. Legislation, such as the First Amendment of the Constitution (U.S.), claims that any conversation between individuals is private. Therefore, strong public opposition concerning issues of privacy and rights has resulted in a general disapproval and therefore a banning of its use in several countries.

Automatic number plate recognition (ANPR) or License Plate Reader/License Plate Recognition (LPR) is a mass surveillance method that uses optical character recognition on images to read the vehicle license plates. Since 2006, the systems uses infrared lighting to scan number plates at around one per second on cars traveling up to 100 mph (160 km/h) (McCahill & Norris 2002a). They are used by police forces on electronic toll collection roads, as well as for monitoring traffic activity. ANPR can also be used to store images captured with a photograph of the driver.

Cellular alarm communications were developed by Swiss researchers from the Institute of Pervasive Computing in Zurich. Switzerland has developed software (Facet) that turns cellular camera phones into video surveillance networks. The software uses Bluetooth technology to connect phones together into a network. Information is shared between mobile phones, and captured events are collectively analyzed and transmitted to a computer through a standard cell phone connection for further analysis.

Roving video surveillance cameras are used in police cars and can scan over 200 license plates per minute. The captured numbers can be compared to a master database of registered vehicles to search for matches for stolen vehicles or other illegal reasons. Unmanned aerial vehicles (UAVs) are mainly used by the military for high-risk security reasons. Israel and Belgium have been using UAVs for surveillance. In Belgium, they are used to track manifestations, navel polluters in the North Sea, and traffic circulation and port activity. For Israel, UAVs are also used to track manifestations, activities around mosques and monitoring activities in Jerusalem on Fridays as well as in the Gaza Strip (Bôle-Richard, Roche & Stroobants 2007). Israel has also invested in UAVs that can launch missiles. In Peterborough, UK, the government implemented an unmanned aerial device that can survey any terrain, and take off vertically from a solid surface. It can travel roughly 30 to 40 miles per hour. CCTV technology has become an important security tool for a few countries and addresses issues of protection and security versus individual rights.

The origins of CCTV

Video surveillance can be traced back to the 1950s with the expansion of information and communications technology. At this time, cameras were mainly used for traffic management, and in banks and shops. It was only in the 1960s that video technology began to expand in cities, mainly in the United Kingdom and United States. However, the real 'father' of CCTV implementation is the United Kingdom, whereby since the 1980s the UK government has installed cameras at a rate of 500 per week (Goold 2004). With the growth of urban areas and consumer society in the 1970s, mass video surveillance was adopted as a tool for monitoring shoplifting, mass events, private property, public urban transport, hospitals and schools. In the UK, video surveillance cameras were installed in four major underground train stations and at the same time began monitoring traffic flow on major highways. In the United States, the use of video surveillance was not quite as prevalent until the 1980's for public areas, but store owners and banks quickly understood the value of it. The mid-1980s marked a move away from local authority control over crime issues towards a more state-led approach. Stephen. J. Fay (1998) explains that CCTV diffusion was due to "its promotion as a panacea for a wide range of social and economic problems by a variety of state agencies and commercial organizations" (p.316). Newburn and Hayman (2002) discuss how the growth of urban areas led to increased pressure on the national government to act on rising crime rates. During the 1990s, CCTV technology began advancing at significant rates. Newburn and Hayman refer to the 'rush' to install video surveillance systems in public spaces, whereby politicians and local authorities became more inclined to adopt CCTV. They relate this phenomenon to a declining faith in criminal justice system, a response to the rising local crime rates and a political emphasis on Inter-Agency/Partnership.

In the mid-1990s, a more affordable system called Digital Multiplexing was developed and thus revolutionized the video surveillance industry. Digital multiplexer units enable recording on several cameras at once and has features like time-lapse and motion-only recording, which improved the efficiency of recording. During this time in the U.S., video cameras were installed in ATM's so to record all transactions. After the first attack on the World Trade Center in 1993, the New York Police Department, FBI and CIA installed surveillance cameras surrounding the area. Since the attacks on September 11 2001, software developers have been constantly refining programs that would enhance video surveillance, including facial recognition. Now, with the rise of the internet, video surveillance can be instituted almost anywhere and be watched by anyone.

What are the uses of CCTV? Who is targeted?

A major setback of CCTV technology is the lack of a standard and clear outline on the uses of CCTV and the targeted population. Muller and Boos (2004) are one of the few who attempt to clarify its uses. Based on their study, they found that CCTV is generally used for information on access control, conduct control, registering evidence, flow control and the planning of

deployment. In terms of selection of targeted individuals or groups, Norris and Armstrong (1999) created eight categories of suspicion targeted by video surveillance operators. These include *behaviour* suspicion, which is based on recognizing abnormal behaviour; *category*, which is a suspicion based on personal characteristics; *location* that is based on a person's location; *personalized*, which suggests prior knowledge of the person; *protection*, which infers monitoring a vulnerable person (single women, children); *routine*, which is based on a set surveillance path; *transmitted* that refers to a suspicion based on an outside source and finally; and *voyeuristic* or for entertainment purposes.

Evaluation and Analysis

There are a variety of issues which have surfaced due to the implementation and adoption of CCTV technology in public spaces. The main issues are conflicting and have stirred critical debates. Therefore, the following section will provide an in-depth evaluation and analysis of each issue, which fall under one of three focal topics: CCTV as an effective safety tool, CCTV as a management tool and the ethical challenges involved. In evaluating CCTV as an effective safety tool, this part will explore its use as a tool for crime-solving, for helping the police, for crime prevention/reduction and for building feelings of security. As a management tool, CCTV technology will be assessed in terms of its financial costs and benefits, technical problems and the need for proper guidance (to integrate a broader strategy). The final section will explore the ethical challenges involved in CCTV use and implementation and therefore analyze its role as a deterrent, the issues surrounding the protection of rights and freedoms of individuals (laws and regulations) and the distancing of social control and discrimination.

II a. Is CCTV is an effective safety tool for crime-solving?

CCTV represents a new and valuable weapon in the fight against crime and public disorder...greater control over environment and information (Goold 2004: 3).

CCTV systems can provide warning signs of potential criminal offences and act as a reactive tool. CCTV monitors crowds and individuals, responds to threats and thus notifies the operator(s) of harmful behaviour and actions before, during and after the occurrence of an event (McCahill & Norris 2002a). For example, video surveillance cameras have been extremely useful in identifying the offenders of the 1994 Bishopsgate bombing and the July 7, 2005 London bombings (Switzerland Federal Department of Police and Justice, 2007). In Barcelona, video surveillance cameras allowed authorities to find a young Spanish man who aggressively attacked a Latino-American man in the metro (Cambon 2007). Such events have spread awareness on the effectiveness of the system as a safety tool, which has enticed countries, like Germany, to install CCTV systems in public transit systems in the case of preventing and recognizing similar events. CCTV systems offer constant surveillance in places where humans cannot see, i.e. tunnel of a train. In the case of an incident (fire), this technology can inform and conduct both helpers and others on the situation and possible exits for escape (Muller and Boos 2004). Furthermore, they can be an effective tool for surveying 'sensitive' areas when other security forces are not available (Switzerland Federal Department of Police and Justice, 2007).

II b. Is CCTV is an effective safety tool for reducing crime?

For certain institutions, government agencies and social science researchers, CCTV technology is deemed as an efficient and successful tool for reducing crime rates within targeted areas. There have been, and continue to be, countless studies devoted to proving this stance and asserting the claim that CCTV systems are useful and at times the best solution. Such studies

suggest that CCTV systems have preventative and reactive measures, revive business in desolate or poor areas, increase the efficiency of the police force, build social cohesion, protect the private environment of citizens and assure confidence and ensure feelings of safety and security, thus leading to a more ordered and stable society. However, opponents of CCTV technology claim that there is too much focus on the ability of CCTV to *reduce* crime. John Honovich (2008) states that such a focus produces misleading studies and draws away from a proper assessment and evaluation of the impact of CCTV on solving crime. Instead, he calls for a shift of the focus towards a structural approach; exploring the roots causes of crime.

Most studies that found a causal link between CCTV use and reduction in crime were usually associated with property crimes or car park offences. The UK-based organization Nacro conducted a review of CCTV studies and found that property crimes reduced in areas covered by video surveillance, especially in car parks (car theft). It is commonly found that the presence of cameras in public spaces has had a positive impact on the crimes outlined above. However, the same Nacro review revealed that public video surveillance had no impact on personal crimes (assault, drunkenness). Helten and Fischer's study (2004) in Germany reveals a similar point, whereby CCTV had little or no effect on reducing, what they term as, 'crimes of passion' such as public drunkenness and acts of rage. These studies demonstrate the ineffectiveness of CCTV as a crime reducing tool and moreover suggest that either there is a general lack of awareness of video surveillance cameras or an overall indifference. Other studies have explored the situation of 'Diffusion of Benefits' or 'Displacement', whereby once potential offenders are aware of public cameras they change choice or location of the crime (IACP). In the end, there is no reduction in the overall crime rate. This situation was found mainly for robbery and theft, which according to CCTV advocates are the most prominent and reduced crimes.

An example of displacement is found in the Montreal pilot project on video surveillance cameras. In 2004, the Montreal police installed cameras on St. Denis to monitor and assess the effect on reducing criminal activities in the area. St. Denis, located near the Berri-Uqam metro station, is known for illicit drug deals and other criminal activities. Shopkeepers and residents have expressed concern. The study's findings reveal that the targeted areas for video surveillance did have reduced rates of criminal activities (10% less robberies, 15% less selling of drugs) (Charest et al., 2005). This reduction was specific to the daytime. However, it is important to note that at the same time, there was an increase of police patrolling and arrests in the select areas. Critics of the study suggest that overall rates did not reduce due to the displacement effect. Once individuals knew of the cameras and noticed the increase in police they tended to move location.

One of the main critiques surrounding video surveillance is that it is a 'quick-fix' solution and fails to tackle the *real* problems. In this case, social structures are discriminating and uphold disparities, which fuels crime. In Sutton and Wilson's (2004) study in Australia, their findings reveal that most individuals interviewed noted video surveillance as irrelevant or unhelpful. The central critique was that video surveillance does not deal with the root problems or the causes of crime. Specific issues referred to economic and social inequalities, such as welfare support and housing were the main causes, which CCTV cannot and does not address, recognize or reduce.

Aside from a desire to shift the focus, opponents of CCTV systems claim that there is a significant absence of evaluation, especially independent evaluation on the impact of video surveillance on crime reduction and prevention. Honess and Charman's research (1992) on individual's awareness of CCTV systems reveals that there was no proper assessment of the outcome of installing CCTV systems. Furthermore, interviewees expressed concern that there is no body of independent research being conducted on the use and end product of video surveillance in their locations. These points make us question CCTV technology's ability to reduce and solve crime.

II c. Is CCTV is an effective safety tool for building feelings of security?

In the event of reduced crime, increased feelings of security and safety can have positive impacts on the social cohesion of a community, region or even a state. Ann Rudinow Sætnan et al. (2004) claim that CCTV systems have been instrumental in reducing crime and thus building relations in a once volatile and unsafe area. Increased citizen safety encourages broad participation and interaction in public spaces, which is effective in improving a community's profile and attracting investment (Sætnan et al. 2004). Moreover, increased stability in a specific area can have advantages for economically revitalization, in which the area will attract more investment internally and externally, leading to an improvement in the social status and quality of life of its residents and a reduction in crime.

According to several researchers, CCTV does not reduce feelings of insecurity or safety, proving its ineffectiveness as a crime preventing, reducing and solving tool. Jason Ditton (2000) claims that CCTV cameras do not make people feel safer, but create a false fear, which is enhanced by intense media activity. Further, the camera targets the (innocent) citizen rather than the criminal, imposing a constant fear in public spaces. Terry Honess and Elizabeth Charman's study (1992) found that whether it was in car parks, shopping centers or on the street, the presence of video surveillance did not make the public feel safer. Their results reveal that feelings of discomfort and increased fear in the presence of video surveillance was significantly higher among women, who are commonly labelled as the most vulnerable group to criminal events. In Sætnan et al.'s study, the operation of CCTV systems was found to be discriminatory, suggesting a ghettoization of spaces, which in fact hampers social interactions and economic investment and growth, breaks social cohesion and leads to more crime.

III. Is CCTV is an effective management tool?

Several countries have adopted CCTV video surveillance technology not as a measure for social control, but as a management tool to monitor and administer transport systems, rationalize the maintenance of building infrastructure and fire prevention, and for the management of social spaces. Countries like Switzerland have widely adopted CCTV technology as a tool for operational management of public areas (for example, CASTOR: centre autoroutier de surveillance du trafic et de gestion opérationnelle des routes nationales). In the 1990s, the Zurich main railway station, the largest in Switzerland, became a public enterprise. Due to its role in internal and external transport, the station became an important location for CCTV cameras for monitoring the considerable amount of activity. Muller and Boos (2004) claim that "the cameras act as a tool to support some monitoring personnel in their decisions (...) as a symbol for a self-selection of access" (p.166). High density areas are becoming key targets for CCTV systems. In 2006, the China's national government adopted the Safer Cities Program by investing \$30 million on biometric systems, which were installed in 660 cities. This technology was crucial for the Olympics, as a means of managing crowds and monitoring activities during such a high-security period (Musy 2008).

Countless studies demonstrate that CCTV systems are an effective management tool since they are less expensive than police officers and are more efficient in detecting or preventing criminal offences. Don Babwin (2007) asserts that unlike security personnel, cameras are not subject to fatigue or loss of concentration and therefore provide uninterrupted and consistent effort. Therefore, the financial burden of the initial expense of purchasing and installing the system is thwarted by its long-term efficiency over employing additional police officers who may be less valuable. Moreover, CCTV systems are also a key tool for helping police forces in solving crimes. Gould (2004) conducted a study to examine whether the organization and management of a CCTV scheme affected the way in which surveillance was carried out. His work reveals negative and positive outcomes. In several cases, the government installed CCTV systems without

consultation with the police, or if the police took control, the impact was limited. However, there was a strong link between active video surveillance and police feeling safer when patrolling. In addition, it was useful for gathering information and as a method used **in conjunction** with patrolling. It is important to keep in mind that this example is not universal, yet aims to demonstrate some common outcomes. Therefore, assessing the impact must be context-based.

CCTV technology is increasingly affordable and has been deemed successful in improving the efficiency of police forces. Debates surround the issue of the financial burden of video surveillance cameras and the pressure to update such systems at an increasing pace. Leman-Langlois (2003) discusses the introduction of IP networks, which have reduced the transmission costs and aim to offer more affordable prices to not only developed nations, but extend the service to governments of low and middle income countries. There has been discussion over the installation of CCTV as a cost-effective means for replacing the police force. Heidi Mork Lomell (2004) suggests that CCTV systems are not a replacement for the police force, but enhance their work. In this case, such systems are most effective when they are used in conjunction with other crime reduction measures (police patrolling, etc.).

For Honess and Charman (1992), CCTV systems have been deemed as poor substitutes for proactive police activity. In Germany, there have been ongoing debates about the deployment of CCTV in public spaces, those located in privately owned public spaces such as shopping malls. Helten and Fischer (2004) claim that in Germany, video surveillance ignorantly leads to unnecessary fear and inefficient police forces. Cameras do not react to human-defined situations and thus crime prevention efforts are dependent on human action. Leman-Langlois (2003) states that it is not about the quantity of detection, which many assert to be the 'crux' of CCTV technology, but the quality of detection and the action taken afterwards. If there is no action after detection, then the system is irrelevant for crime reduction. CCTV systems are an ineffective excuse "to do public order without having to obtain, maintain or rely on public trust (...) reduces intimacy of community" (Leman-Langlois 2003:13). Security personnel and the police force have become more lazy and dependent on technology to do their job, yet still hold an immense sense of authority as operators. Denmark uses CCTV technology mainly in public commercial zones, such as shopping malls. There has been growing criticism concerning the appropriateness and effectiveness of using security guards as the main watchers of video surveillance monitors. Sætnan et al. (2004) discuss how security guards are expected to assess a situation and decide if to contact the police, giving them enormous power on determining and assessing action against criminal activities. According to the UK Home Office Research Study (Gill and Spriggs 2005) "surveillance on crime is positive, but diminishes over time", mainly due to poor video quality (ex. Montreal pilot study) and the time delay of police deployment and action. Therefore, there are faults with using CCTV as a sole measure and thus cheaper and alternative methods may be more practical and useful.

An important point to note is that most individuals are not aware of the presence of CCTV systems in their local areas. Francisco Klauser's study (2004) in Olten shows that most individuals were aware of video surveillance in private institutions, such as shops, banks and government buildings, yet not in public spaces. In an International Association of Chiefs of Police study, it was found that most people found it acceptable for CCTV systems in police cars, interrogation proceedings, inside/outside government buildings and special events. Klauser reveals that most people were unaware of cameras located in public transportation spots, as well as those placed in private spaces which were observing public spaces. This significant lack of awareness suggests that CCTV systems cannot be used as a useful deterrent method; its role in crime prevention is minimal. Moreover, lack of awareness suggests that there is no or minimal public consultation. In Honess and Charman's study (1992), interviewed subjects expressed a strong concern over the lack of community involvement in the process of CCTV system installation. This issue may be significant for understanding the low to zero awareness of public video surveillance. The study reveals that decision-making processes on the topic of CCTV is restricted, hierarchal and thus problematic. In this case, the disregard for community and local

level perspectives, participation and cooperation further hinders the use of public video surveillance as a valuable management tool.

According to Leman-Langlois, the main issues relating to CCTV use come down to the technical problems involved. He is referring to the importance of properly installing such devices so that they will be fully operational and effective. With the rapid changes occurring in the realm of CCTV technology, technical problems are bound to occur and the local security person accessing the CCTV central system is ill prepared for a breakdown or malfunctioning (Honovich 2008). Moreover, cameras can pose additional problems: limited area of coverage, poor design and tape quality, improper use, lack of maintenance and lack of enthusiasm by the users. These issues are crucial in terms of recognizing that technical problems hinder the effectiveness of CCTV systems, and several of these problems are not addressed or even recognized in the first place. The lack of training and available manuals/guidelines is a major hindrance. Yet, the question to ask is: with ongoing advancements and changes of CCTV products as well as the vast diversity, can training and manuals be made available at such a pace? This leads into the financial burden of implementing cameras and related centralized control systems. The cost of one camera, depending on the model, quality, etc., imposes an enormous weight on the budgets of local and provincial governments, and one must factor in the mounting pressure for purchasing newer systems. This leaves little room for assessment of CCTV implementation and its cost-effectiveness.

The effectiveness of CCTV systems significantly depends on **proper instruction and guidance**. There have been several attempts and initiatives to provide manuals and training on CCTV system uses and potential problems. In 1994, the UK Home Office published a CCTV instruction manual for councillors, business people, police etc. on the mechanisms and functioning of CCTV systems, its use and reason for installation. This is an example of an effort that ensures appropriate use and understanding of the technology, in order to avoid abuse or misuse. Another initiative was led by the IACP with Security Industry Association, which hosted a summit on 'CCTV for Public Safety and Community Policing' in April 1999. At the summit, a set of guidelines on responsible use of CCTV in public spaces were circulated to law enforcement agencies and CCTV manufacturers for review and comments. The guidelines addressed a broader range of issues such as the psychological response in implementing CCTV, involving the community, and the necessity for training and education for law enforcement agents. This initiative reveals one of many attempts by government and independent organizations to reduce inefficiency and mishandling.

IV. Ethical Challenges

According to the 2006 Privacy International Report, government's policy initiatives on security are 'destabilizing core elements of personal privacy' (p.3). Therefore, there must be an understanding on how changes in privacy laws, technologies implemented affect legal and constitutional protections, individual rights, freedoms and autonomy, democratic institutions.

The use of CCTV technology has stirred ethical concerns. These concerns refer to the lack of privacy protection, the repression of individual liberties for the 'greater good' and mounting fears of insecurity. They have stimulated the rise of rules and regulations which aim to protect individuals' rights and freedoms as well as regulate the use and output of information captured by such systems. Politicians who abide by CCTV as an effective and successful method in the field of crime prevention, suggest that the presence of CCTV systems in public spaces act as a deterrence to criminals or potential offenders. Therefore, innocent individuals should not be bothered by its presence. The cameras target offenders and thus offer no harm to the general public. This mentality is widely used to convince the public that CCTV systems are used for a specific reason and do not impinge on issues of privacy or civil liberties. This mentality in fact

poses an ethical concern, which assumes that in general individuals are innocent and must give up some liberties for the 'greater good' (to detect the 'rotten apples in society'). For many, this entails a repression of rights and freedoms in the name of an ineffective method (Bach 2008).

In several countries, the public has expressed concern over the issue of how improvements in technology (increasing places under surveillance) are detrimental to the protection of privacy and personal data (Ruegg et al. 2004). France's Commission national de l'informatique et des libertés (CNIL) warns of the dangers of CCTV of taking away freedoms of individuals (Guibert and Langellier 2007). In this case, there is also an absence of structures of accountability when it comes to controlling, monitoring and assessing information from CCTV systems. Fay (2004) suggests that there is a concern that authorities and operators of CCTV systems may abuse it for personal or collective interests: bribing, entertainment, court cases, etc.

Sound recording technology is another highly controversial topic with ethical concerns. Sound recording, or Smart Sensor Enabled Neural Threat Recognition and Identification (SENTRI) is widely used in Chicago. The technology can track gunshot sounds within a two-block radius, pinpoints the source and then turns a surveillance camera toward the shooter and places a 911 call. Officials can track the shooter and send dispatch officers to the exact scene. The technology has spread to Los Angeles, Tijuana, Mexico, Philadelphia and San Francisco, while New Orleans and Atlanta have made inquiries. "As long as the cameras and SENTRI system are set up in public spaces, they do not violate the law" (Reichgott, 2005). Sound recording technology has created ethical issues regarding the repression of civil liberties for community safety. Many argue that it is a huge burden on finances and individual rights, and is not responsible for Chicago's diminishing crime rates.

Another ethical issue surrounding CCTV is its role in the increasing exclusion and discrimination of certain groups and individuals. Stephen Graham (2002) refers to 'exclusionary and inclusionary' powers, which lead to social boundaries or the exclusion of certain groups in society which are deemed as 'disruptive' to social order. This situation results in unfair targeting of groups and stigmatization. Honess and Charman found that video surveillance controllers were over-scrutinizing young black males, and 'scruffy people' without due cause. CCTV imposes stereotypical expectations, guilty by association charges and misinterpreted innocent actions. A study conducted in Oslo, Norway revealed that citizens articulated a concern about video surveillance controllers targeting 'scruffies' for no obvious reason, which causes marginalization. Stephen Graham (2002) says that these outcomes reflect a dangerous level of power given to "automated, algorithmic and invisible systems of social control" (p.239-40) which can cause more harm than good to certain individuals.

Klauser (2004) discusses the impact on spaces and interactions: "video surveillance is changing the territoriality of public space users" (p.158). In other words, CCTV is **restructuring the urban landscape** as places of consumption, whereby private management systems are taking over and controlling public spaces as well as social, political, economic and spatial processes. Fay (1998) says that dominating consumption landscapes are the reason for installing CCTV technology. In this case, the reasons are 'egotistical' and entail economic benefit to retailers in urban settings. The outcome is that individuals are stigmatized and excluded from certain public spaces due to their geographical location, ethnicity and social status for the sake of capitalistic motives.

Collecting CCTV images has become an issue of protection of individual privacy. Currently, in the UK, there is a **CCTV Code of Practice** which requires that public CCTV systems are signposted with data controller's details and purpose of surveillance. This information is transmitted to the Information Commissioner who encourages compliance with the Data Protection Act 1998 so that their schemes adhere to data protection legislation (Parliamentary Office of Science and Technology, 2002). Moreover, there are national standards for training operators in the use of CCTV or data protection issues. However, for many countries like the UK, the number of CCTV systems is unknown and many private operators are unaware of the Act.

There has been public concern over the privacy of information and holding of information. In this case, private security companies store and destroy information captured on their cameras. There is little or no regulation to ensure information protection. Moreover, there have been major problems concerning the transmission of information from private security companies to police forces. Under the Data Protection Act 1998 and the Crime and Disorder Act 1998, images can be disclosed to third parties for crime prevention and detection. According to the CCTV Code of Practice, CCTV images of individuals should be released to the media only when the public is likely to provide information concerning a criminal incident. If disclosed for other reasons, individuals in the image should be disguised. Yet, there are no nationally agreed protocols for sharing such information, although national organizations like CCTV User Group has established models for management and operation of CCTV systems. Furthermore, investigative procedures and legislation have established standards for the collection and processing of images for use in court, the sharing of personal data by authorities, good practice for showing CCTV footage to witnesses for identification and the regulation of targeted surveillance. However, abuse maintains, whereby CCTV images have been disclosed to the media, such as in the Brentwood Borough Council which released CCTV footage of a man attempting to commit suicide to the BBC (Parliamentary Office of Science and Technology, 2002). This incident led to the UK courts to 'recommend' tighter guidelines for releasing images to the media, but no regulations have been established.

Regulating the use of CCTV

There exists a variety of frameworks, local, national and international, which aim to protect and secure privacy and safety rights of individuals in society. However, are these frameworks respected and enforced? Despite legal instruments, individuals are not always protected within direct intimate and private environments (Ruegg et al. 2004). In this case, the powers of federal officials for data protection are limited, there are no compulsory regulations and there is no enforcement for camera registering in private institutions. Ruegg et al. (2004) elaborate that it is extremely difficult to enforce rules of private cameras which focus on public spaces. There is a clear lack of codes of practice and a fear that commercial interests override individual's freedoms and rights.

Existing regulations include the Data Protection Act 1998, European Convention of Human Rights (ECHR) Article 8, Council of Europe's guiding principles for video surveillance, International Covenant on Civil and Political Rights (ICCPR) Article 17 and Private Security Industry Act 2001. The Data Protection Act outlines how data must be processed, obtained, held and shared. Exemption from the Act is available for purposes of safeguarding national security or compliance for crime detection purposes. Individuals also have a right to request copies of images that are held of them. The Human Rights Act Article 8 states that everyone has the right to respect of private and family life. However, public authorities may interfere with this right if it is in the interests of national security, public safety, prevention of disorder or crime, or for the protection of the rights of others. The Private Security Industry Act requires that members of the private security industry be licensed. The International Covenant ensures that all individuals have the right to privacy and privacy protection, whereas the Council of Europe's guidelines outline the procedures for properly using CCTV technology and the protection of information.

V. Conclusions

Below are some recommendations, which aim to stimulate further discussion on the (in)effectiveness of CCTV technology. Due to the ongoing nature of the debate on CCTV, there has been little room for assessment and solution. These recommendations attempt to highlight and discuss the main areas of concern, in an attempt to help policy making decisions reach an effective conclusion.

These points reflect a synthesized version of the main concerns outlined in the report.

- An independent authority for evaluation/assessment of CCTV utility on crime prevention and reduction
- Reformulate the use of CCTV away from crime reduction
- Assessing if public safety goals should be motivated by public interest or by private sector commercial interests
- Tackle the root causes of crime
- Promotion of 'best privacy practice': ensure openness, data protection, compliance with law
- Public consultation: work with civil society actors
- Context based policies necessary for enhanced efficiency
- Use of CCTV technology to promote democratic accountability

These recommendations suggest that there remains much work on assessing the true effectiveness of CCTV technology as crime-solving, prevention and reduction, and management tool within each country. Despite the universal application of these policy recommendations, they intend to promote discussion at all levels, since CCTV technology is globally utilized and debated.

This report covers a significant amount of information with an attempt to conduct a unique endeavour of outlining all the facets involved, as well as to display the complexities and difficulties in evaluating the related issues on an international level. In the end, evaluation of CCTV technology and its multiple dimensions depends greatly on the **context**. "It is important for each country to decide rationally and openly which element of personal privacy should be lost, but it is also important for each country to understand how far down the path of mass surveillance it has travelled" (Privacy International 2006: 3). Therefore, there needs to be country-level assessments in terms of localized laws, regulations, structures, initiatives and public reaction. Second, there needs to be an analysis based on **political use of implementation** within a context-based framework. In this case, there has been, and continues to be overall public distrust of CCTV technology. Moreover, studies have revealed general poor evaluative results, like in the case of Toronto. For example in 2006, Toronto's Police Service conducted a 6-month study on CCTV use for advancing community safety. The pilot study was slightly different from that of Montreal's since it was accompanied by surveys and public consultation meetings. However, the results of the pilot study were unsatisfactory. The study reveals that CCTV systems do not deter offenders and instead promote a false sense of security. There was major criticism that video surveillance is a "band-aid solution" that does not address the cause(s) of the problem(s). Instead, resources should be directed towards community programs. Despite the negative response to the study, in 2007, the Toronto Police invested \$17 million in video surveillance technology during the holiday season. Currently, the police use CCTV systems to deter criminals and help arrests, as well as to identify and charge those who ignore and commit crimes.

The important point is that despite such public reaction and negative results, governments and organizations continue to install and use CCTV technology. This phenomenon suggests that important **political discourses** are involved. Sutton and Wilson (2004) examine how the rise of neo-liberalism in the Western world led to the rise of punitive and exclusionary emotions, leading to culture of insecurity, intolerance and a 'tough on crime' mentality. They explain that CCTV technology is a consequence of the increasing centralization of control under the neo-liberal framework. In the case of Australia, the growing influence from the UK and US for 'tough on

crime' mentality has drawn in national government involvement. The result has been a sudden and immense expansion of open-street CCTV. Sutton and Wilson (2004) warn that Australia is developing into a surveillance society despite the lack of proper evaluation and assessment on its effect on solving the problem. There is tendency to link the privatization of public space(s) with the **emergence of a penal state**, which introduces added fear and insecurity. The result is the transformation to a risk or surveillance society. From Jeremy Bentham's prison design Panopticism, to Foucault's "Disciplinary Power", George Orwell's 1984 and Huxley "Brave New World" and finally James Rule's *Private Lives Public Surveillance*, there have been countless attempts to discuss the surveillance society phenomena. One must ask: is the introduction of CCTV technology responsible for this transformation? Leman-Langlois (2003) says "surveillance will always tackle 'crime,' because crime is the product of surveillance" (p.3).

Third, society in general has transformed into a 'battle-space' whereby the commercialization of the urban area has stimulated a private-public network of control and ultimately, technologies (like CCTV) than secure that control (Lyon 1994; Lomell 2004). In this case, economic interests are repressing individual liberties. For example, during the late 1990's Oslo, Norway experienced a significant increase in the development of **public space commercialization**. Urban area developments led to the installation of the first open-street CCTV in 1999 by the Oslo Police. In 2001, the Lyons government set up the Lyons Local Security Contract (CLS), which initiated the installation of CCTV systems in the area. The main push for the contract came from shopkeepers who were concerned about rising youth crime ('imported delinquency from the suburbs'), which was harming business and increasing fears of insecurity and lack of safety for the residents. Martinais and Béтин (2004) critique the Lyons contract, suggesting that CCTV installation is purely an economic/self-interest motive which appeases the wealthy areas, keeping them sanitized and impersonal, while leaving the poor areas to protect themselves.

In conclusion, this report has provided several discussions on the rise of CCTV technology around the world as a safety and management tool. It evaluates CCTV utility and effectiveness through a variety of case studies and topics, and concludes with recommendations for progressive research and thinking. This report further aims to review the facts and arguments and analyze the implications and outcomes. In the end, more research is needed so to explore the public's reactions to the transformations in society: the growing surveillance society, neo-liberal policies, globalization processes and capitalism. In many cases, the public is left out of this important discussion. Therefore, readers, academics, government officials and policy makers should reflect on this report and use it as a reference guide for assessing the main issues and addressing effective solutions.

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