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Behind the Camera: CCTV operators' perspectives of technical, legislative and operational changes in a UK public space CCTV Security Control Centre from 1996 - 2019.

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Abstract

25 years ago, the UK government spent millions on mass expansion of its public space CCTV surveillance networks. The 2008 global financial crisis and recession triggered severe funding cuts for public services. Some public space control centres closed down entirely, whereas others continue to expand and develop their networks. This research investigates the impacts of economic, technological, legislative and operational changes on the day to day functions and relationships in a public space CCTV control centre in Northern England from 1995-2019. It seeks to explain how issues in contemporary society are shaping the face of surveillance.

1 Introduction

The globalisation of surveillance is at the forefront of contemporary discourse concerning privacy rights and crime control, however there is very little research into contemporary public space CCTV surveillance. The UK is viewed by many as the pioneer of CCTV surveillance, with extensive networks provoking theories of a 'maximum surveillance society' (Norris and Armstrong, 1999). There is no single reliable data source documenting the number of CCTV cameras in the UK today. Studies estimated around 4.2 million cameras were in operation by the mid-2000s (McCahill and Norris, 2003; Welsh and Farrington, 2007; Woodhouse, 2010). A more recent survey conducted by the British Security Industry Association (2013) concluded that there could be up to 6 million CCTV cameras in public places. Young (2018) notes that this number could be significantly higher following the rapid development of mobile technologies such as body worn cameras and drones.

Keval (2009) outlines three key phases of evolution in CCTV technologies; 'Phase one' (1965-mid 1990s) was the analogue era where CCTV was recorded directly onto VHS systems in a closed loop. 'Phase two' CCTV systems were designed to address the inadequacies of earlier systems by converting analogue video signals to digital recorders, usually hard disk drives (HDD), negating the need to store banks of video tapes. Image quality was remarkably improved and costs of fibre rental were eliminated as video signals could be transmitted via wireless networks (ICO, 2017; Keval, 2009). It was around this time when the most recent in-depth criminological control room studies were conducted. The third phase is described as 'intelligent CCTV' (Keval, 2009: 14) as various functions can be adapted to assist operators to carry out their duties and increase crime

detection. Examples of 'intelligent' CCTV systems include facial recognition and automatic number plate recognition (ANPR). Most research into 'intelligent' CCTV systems focusses on facial recognition which was first used in Newsham in 1998 (Keval, 2009). Thus far, there is no empirical criminological research into newer types of intelligent CCTV such as advanced autonomous motion detection cameras.

The rapid expansion of CCTV was rooted in political ideologies and schemes such as 'Safer Cities' which sought to 'crack down on crime', encourage 'café culture' and '24-hour cities' in an attempt to revitalise town and city centre economies after the recessions of the late 1980s (McCahill, 2002). Hundreds of public space CCTV control centres were set up to monitor sprawling CCTV surveillance networks. Over 78% of the Home Office's crime prevention budget in the mid-1990s was spent on developing CCTV infrastructure throughout the country (Koch, 1998). Extensive research was conducted into the inner workings and operation of control rooms during CCTVs rise to ubiquity (Goold, 2004; McCahill, 2002; Norris and Armstrong, 1999; Smith, 2004), but very little has been conducted since, in which time there have been significant changes to technology and legislation. Where research has been conducted, it is mostly with mundane reference towards 'effectiveness' and 'usefulness' (Barton, 2003). The 2008 global financial crisis triggered a major recession in the UK causing a rise in unemployment and a sharp drop in consumer spending. Town and city centres were once again barren landscapes of empty shop fronts and neglected buildings. By the early 2000s CCTV was the subject of antagonistic journalism which portrayed it as another expensive, failed government scheme (Smith, 2012). Many UK public space control centres were forced to close due to

unattainable funding costs, yet others continue to function, and networks continue to expand.

CCTV operators from a local authority owned control centre in Northern England were interviewed about their experiences and perspectives of changes and developments in technical operations, working relationships and operational changes. The Security Control Centre (SCC) was opened by *Northern Council* in 1996 at a cost of £1.1million, partially aided by government funding from the ‘CCTV Challenge Competition’. The primary purposes of the SCC were to monitor public space CCTV and telecare alarms for elderly, disabled and vulnerable people. In 1995, there were 69 CCTV analogue multiplexed cameras installed to monitor two towns. The SCC currently monitors 110 digital, 16 analogue and 2 automatic motion detection cameras across five towns.

Operators’ perspectives on the impacts of technological, legislative and operational changes will be used to bring the story of the ‘electronic eye’ up to date and explain the functions and roles of public space CCTV in contemporary society. This research cannot explain differences between control centres, but it will provide an overview how *some* control centres function in contemporary society. Furthermore, I will examine practical applications and use of innovative automated technology (fully automatic cameras) and its impact on society – an area of research which has not yet been studied in a criminological setting.

2 Literature Review

Most CCTV control room studies were conducted between 1990 and 2005 and have varied empirical results. There is very little recent research examining how various aspects of contemporary public space CCTV surveillance have been affected by political, economic and legislative changes in the past ten years. There is hardly any research examining the impacts of austerity on public space CCTV. Some public space CCTV networks have been shut down entirely, whereas others are spending money on expanding networks (iComply, 2013). Most contemporary surveillance theories assume that the presence of CCTV removes anonymity and deters crime, however the nature of public space surveillance is complex and diverse.

From ‘CCTV Challenge Competitions’ to ‘Austerity Surveillance’

The UK government heavily invested in public space CCTV in the early-mid 1990s as part of its ‘Safer Cities’ and ‘Partners Against Crime’ schemes (McCahill, 2002; Crawford, 2007). ‘Safer Cities’ projects were government funded initiatives designed to reduce crime, the fear of crime, improve economic and community life and build working partnerships within communities (McCahill, 2002; Newburn, 2017). Approximately 78% of the Home Office’s crime prevention budget was used in the early-mid 1990s to build CCTV infrastructure throughout the country in order to reduce personal and property crime in urban areas (Koch, 1998; Welsh & Farrington, 2007). The government spent £200 million on public space CCTV between 1994 and 1999 (Armitage, 2002; Kroener, 2016). *Northern Council’s* SCC was opened in 1996 having received funding from the governments ‘CCTV Challenge Competition’ – a ‘Safer Cities’ initiative. The money awarded was only to assist with the initial set up of the control centre and CCTV network;

local authorities are responsible for ongoing maintenance costs (Keval, 2009). Newburn (2017) argues that 'Safer Cities' was representative of a shift of focus from crime prevention to community safety. A further £400 million was allocated to 'Crime Reduction Fund' projects under New Labour between 1999 and 2002. Some local authorities were granted up to £250,000 to improve or extend their existing CCTV networks (Newburn, 2017). Research study findings outline the rapid growth of public space CCTV in the early-mid 1990s; In 1987 two UK towns/cities had public space CCTV provisions, compared to 39 in 1993, 79 in 1994, 90 in 1995 and 167 by 1997. By the mid-2000s, there were over 500 schemes installed (Bulos & Sarno, 1994; Fyfe & Bannister, 1996; Armitage, 2002).

Media exposure of CCTV footage in high profile cases (e.g. James Bulger) alongside reports of rising crime figures evoked public outcry and perpetuated the 'fear of crime' which increased support for CCTV, prompting the swift promotion of open street surveillance (Beck and Willis, 1995; McCahill, 2002; Norris *et al*, 2004). Overt CCTV cameras were a reflexive symbol of reassurance to the public in a 'risk society'. They also served as a constant reminder to criminals that their behaviour was being watched. They showed that the government acknowledged criminality and was attempting to address it under the guise of promoting public safety for the majority (Crawford, 2007). Poor, grainy image quality was an unavoidable trait of many early CCTV systems simply because the technology was not advanced enough to show clear, undistorted pictures (Hickley, 2009; Young, 2010). Earlier grainy images often provoked criticism and disparagement when shown in public - for example on TV shows such as 'Crime Watch' (Welsh & Farrington, 2007). The digital age has transformed the ways in which technology is used

to monitor, control and record crime (Taylor & Gill, 2014; Woodhouse, 2010). One of the most obvious technical developments in contemporary CCTV is the quality of the images. Theoretically, high definition cameras are more pro-active crime prevention tools as clearer images make it easier to identify persons of interest (ICO, 2017).

Graham (2001) believed that public space CCTV networks would continue to expand and rise to ubiquity over the following twenty years, which, at the time of writing seemed like a reasonable assumption considering the amount of money the government was investing in CCTV. Most of the studies concerning CCTVs 'rise to ubiquity' were conducted in the 1990s and early 2000s. There was a general assumption that CCTV was a future proof solution, this is one of the driving factors for my research – these assumptions were made almost twenty years ago, so the future in that respect, is now. How does a public space CCTV control room function in contemporary society and crucially, how are current political, social and economic factors shaping contemporary public space surveillance? Smith (2012) argues that contemporary studies should now focus on the retraction of CCTV rather than its growth. The global financial crisis of the late 2000s has certainly affected public space CCTV provisions. The UK experienced its longest post-war recession from 2008-2013 which subsequently triggered severe financial cuts, low economic growth and high unemployment (Smith, 2012; Teal, 2018). Many public sector services suffered budget cuts which forced some control rooms to cut staffing budgets, opening hours, maintenance budgets and in some cases, to close completely (iComply, 2013).

A variety of sociological, political and economic factors triggered by the recession began 'collectively eroding the electronic eyes ideological and material hegemony in the public

imagination' (Smith, 2012: 47). Neoliberalism had propelled the rapid growth of CCTV networks, and to a degree it is responsible for the retraction of those networks (Smith, 2012). Austerity measures triggered by the economic recession were at the forefront of the public mind. Rapid technological development and natural degradation meant that many systems were becoming obsolete by the early-2010s and many authorities desperately needed money for upgrades and maintenance. CCTV had historically been sold to the public through promises of effectiveness and reassurances of safety, however the recent recession led to scrutiny and framing of government incompetency (Smith, 2012); A prolonged spate of critical, negative media coverage in the early-2010s challenged the political ideologies supporting CCTV by focusing on high maintenance costs. Cost-saving evidence-based decision-making gained prevalence subsequently making CCTV an easy target for antagonistic reporting (Smith, 2012; Webster, 2009). Smith (2012) argues that further cuts to public services such as policing have allowed journalists to develop a deeper critical understanding of the necessity, everyday value and application of CCTV.

A 2012 survey of 58 local authority CCTV control rooms found that 42% had very little or no change to their yearly budget for maintenance, installation and operational costs, however a third reported that their budgets had been reduced by up to 30% compared to the previous year. 36% of operators cited the need for new equipment as one of the most challenging issues. On the other hand, 26% reported small increases (5-10%) in budget allowances in comparison to the 2011/12 financial year (iComply, 2013). Differences in budget allocations and funding for CCTV provisions vary for several reasons. Firstly, higher levels of unemployment can increase the number of recorded crimes. Most

research had concluded that this specifically relates to property crimes rather than violent and financial crimes (Lin, 2008; Papps & Winklemann, 1999; Janko and Popli, 2013; Sumner, 1997 cited in Newburn, 2017). Higher crime levels demand higher levels of policing, manned continuous police patrols require unattainable levels of resources and funding, so there is a higher demand to substitute patrols with CCTV (Newburn, 2017). Some control rooms introduce cost-saving methods such as offering services to other local authority departments. Others reported that they had integrated existing networks into one platform or invested money in upgrading to save money in the future, however with the rapid development of technology it may mean major upgrades are required again in the non-too distant future (iComply, 2013).

Surveillance Theory: Is the Panopticon Still Relevant?

Foucault (1979) explored relationships between knowledge, power and social order, focussing on the changing symbolisation of punishment from the body to the mind. Surveillance is one way in which the government has implemented and extended social control (Lyon, 2001; Foucault, 1989). Utilitarian philosopher Jeremy Bentham's panopticon design is for many, a symbolic image of the structure of surveillance networks (Norris and McCahill, 2006). The word 'panopticon' itself is Greek for 'all seeing'. The panopticon is a type of prison comprising a central watchtower encircled by cells, its design was influenced by Russian factories which were laid out in such a way a minimal number of supervisors could observe the workforce, encouraging conformity through surveillance (Warriar *et al*, 2002).

‘The panopticon is a machine for dissociating the see/being seen dyad: in the peripheric ring, one is totally seen, without ever seeing; in the central tower, one sees everything without ever being seen’. (Foucault, 1979: 202)

Theoretically, surveillance can be adopted in any environment requiring some level of supervision such as factories, asylums and workhouses (Bentham, 1789; Foucault, 1979; Newburn, 2017). Exercising power through surveillance does not require any physical intervention, nor does it require power to be exercised at all times (Koskela, 2002). To Foucault (1979) the key element of panoptic systems is that progressively, people will exercise self-discipline as they become ‘caught up in the exercise of power over themselves’ (Newburn, 2017: 347). Conformity will happen over time if the punishment is severe enough and the risk of being caught high enough (Foucault, 1979). Reeve (1998: 71) argues that open street CCTV systems are symbolic of ‘total surveillance in a rationally ordered society’. Its presence alone can deter individuals from committing offences, because those individuals will never know when they are being observed as there is no way for them to know if someone is watching (Fyfe and Bannister, 1996; Reeve, 1998). Space is a central element of the exercise of power, and power creates and transforms spaces (Koskela, 2002). It is important to note that the panopticon was designed to be adopted within controlled environments, rather than public spaces where continuous surveillance is both practical and necessary (Giddens, 1985).

CCTV is an extension of the human eye which allows operators to see, and to some extent, control environments in real time (Giddens, 1990; Newburn, 2017). The disciplinary gaze of surveillance allows operators to mobilise some form of response to issues and threats; however, the complexities of public spaces mean that continuous monitoring is not always

possible. It is easier to monitor individuals residing in closed environments such as schools, hospitals and prisons, as there is usually some degree of consistency with regards to individuals within the environment making it easier to identify perpetrators of 'unwanted' behaviours (Foucault, 1979; McCahill, 2002; Norris and Armstrong, 1999). Monitoring in open street settings can be somewhat challenging as much of the population may be unknown to operators, thus identification can be somewhat problematic (Norris and Armstrong, 1999). On the other hand, research suggests that operators with local knowledge and familiarity with 'known' offenders may not face some of the issues experienced in larger urban areas (McCahill, 2002; Norris and Armstrong, 1999).

"Technology is made for ordering the world and reproducing it" Lianos and Douglas (2000:263). Modernity has applied these ordering techniques to humans, under the general category of discipline'. The sociological and criminological debates concerning surveillance technologies are largely focused on the transition from modernity to post modernity through the globalisation of movement and communication. Propelled by the fear of crime and uncertainty, a 'risk society' has emerged, as a result, governments and authorities have employed and developed technologies to monitor and reduce security risks and promote public safety (Crawford, 2007; Lyon, 2004; Zedner, 2003). Castells (1996) refers to a 'network society' characterised by evolving 'flows' and 'networks' which transform the way information, people and goods interact and shift through spaces. According to Giddens (1990), new technologies have the 'consequence of foreshortening time' (Newburn, 2017: 342). Together with developed communications and logistical networks, surveillance technologies intrinsically link spaces and places in

ways that were simply not possible prior to the rapid technological developments of the late 20th century.

Clarke (1993; 1997; 2002) argues that CCTV is a tool of 'situational crime prevention'. Situational crime prevention is a pre-emptive approach to reducing opportunities for crime. Control measures are introduced into environments as a means of managing and targeting crime, rather than the individuals committing crime. It is widely acknowledged that CCTV is more effective as a deterrent to property and pre-meditated crime rather than violent crime as offenders simply do not have time to exercise rational choice (Ashby, 2017; Brown, 1995; Crawford, 2007; Gill and Spriggs, 2005; Trasler, 1993; Welsh and Farrington, 2002; 2009). Crimes such as fraud are often very difficult to detect on CCTV as there are very little obvious traits in human behaviours being observed (Ashby, 2017). Theoretically, manipulation and management of any given environment, if done correctly, should increase the risks of detection and reduce the rewards thus encouraging desistance (Newburn, 2017). There is a generalised assumption that the individuals who are aware that they are under surveillance exercise some form of rational choice when faced with increased possibility of detection, however Barton (2003: 61) argues that the CCTV has 'become so pervasive that we often fail to even recognise its presence'. Situational crime prevention fails to recognise other factors such as deprivation, unemployment and inequality as causes of criminality (Farrington, 1995; Garland, 2001). Furthermore, it fails to consider human emotion and implies that rational choice can be applied in all situations.

To understand relationships between CCTV and society, consideration must be given to several factors; it is not possible to generalise assumptions made about one system, or

even one type of system, as background operations, policies and technological capabilities are wide ranging and variable. How systems are operated and the relationships between the observed and the observer must be examined to understand the outcomes of cultural, technological and organisational change (McCahill and Norris, 2002). Consideration must also be given to the type of space under surveillance as CCTV is not simply a single measure; the purpose and type of systems differ depending upon the situation and type of monitoring required (Gill and Spriggs, 2005; Keval, 2009).

Technical Development, Urban Geography and the Decline of the Town Centre

Early CCTV systems were used for military and scientific purposes such as monitoring space shuttle and rocket launches. CCTV was invented in 1942 by German engineer, Walter Bruch, and produced by Siemens AG. The purpose of the system was to monitor V2 rocket launches from a remote location (Ratcliffe, 2016). From 1949 the technology was launched commercially by Vericon, an American government contractor (Kroener 2016; Ratcliffe, 2016). The main advantage of these primitive systems was that scientists and military personnel could monitor hazardous operations from a safe distance without the risk of death or injury (Keval, 2009). The idea of using video feeds to support public space policing in the UK was first documented in 1947. The Metropolitan Police wanted to monitor live TV footage of the Royal wedding to aid policing operations at the event; the request was denied based on unattainable high costs (Williams, 2003; Norris *et al*, 2004). CCTV was first introduced in the UK in the early 1950s. In 1956 two cameras were installed in Durham to enable the police to monitor traffic lights and in 1960 the Metropolitan Police temporarily installed pan-tilt-zoom (PTZ) cameras to monitor

crowds during an event attended by members of the Thai Royal family. The cameras were later re-installed to monitor other events in Trafalgar Square (Norris *et al*, 2004).

CCTV became more prevalent in the 1970s as video cassette recordings (VCRs) were widely available and easily incorporated into analogue CCTV systems, allowing continuous recording. However, the tapes needed to be changed regularly and users would have to store a library of tapes if they wished to retain data for any length of time (Kroener, 2016). Analogue systems required high levels of maintenance and had limited functionalities compared to their digital counterparts (Keval, 2009). CCTV became increasingly popular amongst businesses as an 'affordable, do-it-yourself, self-contained' method of crime control and monitoring (Constant & Turnbull, 1994: 3). In the late 1970s, video quality was deemed enough to monitor high risk security targets such as banks, and CCTV in public spaces was increasingly commonplace (Woodhouse, 2010). Throughout the 1980s CCTV appeared in football stadiums to monitor crowds, on railway lines to control vandalism, on petrol station forecourts to reduce theft, on the London Underground for security, and on major roads and motorways for safety (Ashby, 2017; Woodhouse, 2010).

By the early 1990s the use of public space CCTV had risen exponentially as multiplexing technology emerged which allowed far greater numbers of cameras to be used on one network. Multiplexed imaging displays images from several cameras on one monitor at the same time and records them all to the same tape (Keval, 2009; Norris, 2009). CCTV signals could be transmitted via a multitude of different medias including copper twisted cables, co-axial cables, fibre optic, infra-red and microwave links (WS Atkins, 1995). Fibre optic cable was technically the most superior transmission system due to its

wide bandwidth, low transmission losses and lack of interference from other devices and networks (WS Atkins, 1995; McCahill, 2002). Digital video recorders replaced VCRs, simplifying recording practices and negating the need to store large banks of video tapes. Image quality is significantly improved, and multiplexers are integrated into network video recorders which stream encoded footage to receivers and monitors for remote viewing and recording. One of the main advantages of contemporary systems is that cameras can be streamed via internet protocol (IP) networks and wireless links, negating the need for expensive cable installation and line rental costs (Keval, 2009). Graham (2001) predicted that smaller towns and villages would benefit from CCTV in the future as technological capabilities developed.

Regeneration projects coupled with technical innovations were certainly driving factors in the rapid expansion of open street CCTV networks. Recessions in the 1980s and 1990s and the relocation of prime retail outlets to out of town areas had a detrimental effect on many town centre and high street shops as consumer spending significantly declined (McCahill and Norris, 2002). Financial pressures subsequently resulted in an abundance of empty, poorly maintained shop fronts and buildings. This, along with the presence of youths, drunks, prostitutes and other 'undesirable' characters led many people to avoid using shopping and entertainment facilities (Graham and Marvin, 1996; Norris and Armstrong, 1996; Ramsay, 1989). Town Centre Management groups (TCM) were formed to revitalise and regenerate town and city areas to improve local economies and reduce crime. The government wanted to promote consumerism and revitalise landscapes by pumping money into bleak, abandoned city centres. Notions of 24-hour cities and 'café culture' were at the focus of regeneration projects to draw in consumers. A 24-hour city

is a 'pulsating glamorous place where something is always happening on the streets' (GLA, 2002: 3). Nighttime culture was promoted throughout the early 2000s, amendments to the Licencing Act in 2003 allowed night clubs and bars to stay open for longer. Hundreds of thousands of pounds were invested so the government and TCMs wanted to protect their investments many town and city centres by rolling out large scale open street CCTV schemes to protect shops, stock and consumers from the perceived threats (Bannister *et al*, 1998; McCahill, 2002; Norris and Armstrong, 1996).

WS Atkins (1995) outlined some of the reasons people were avoiding the high street of *Town A* prior to its regeneration in the early 1990s: There was a perception of poor security in the area, consumers were concerned that their personal safety and security was at risk, especially during the hours of darkness. This directly impacted on spending in the town centre, particularly during the winter months. Vehicle theft from public car parks was particularly prevalent in the area, and people felt intimidated by groups of drunken youths using foul language and threatening behaviour. These findings were not based on actual statistics, but the general impressions of the public (WS Atkins, 1995).

The 2008 recession had a detrimental impact on shopping and consumerism in the UK. Shops and businesses closed, spending fell, and town and city centres hosted rows of empty, dilapidated properties. The economy has started to recover in recent years and similar patterns of attempts to revitalise areas blighted by the recession have begun to emerge (Teal, 2018). *Town A* has recently been shortlisted to receive up to £4,000,000 of funding to restore dilapidated buildings and improve road links to revitalise its town centre through the governments Single Local Growth Fund (Leonard, 2019). Part of my research will examine changes in operational focus over time and what effects, if any, the

recession has had on public space CCTV operations in areas suffering economic deprivation.

Control Room Studies, Suspicion and Privacy

Many surveillance systems and organisations are in some way connected to what McCahill (2002) describes as ‘the surveillance web’, a complexity of social and technological processes and interactions which allow operators to communicate, extend the gaze of surveillance and react to perceived threats. Some control centres are equipped with radio links to external parties, e.g. security guards) operating in the areas monitored by CCTV, thus issues can be quickly communicated and responses mobilised accordingly (McCahill, 2002; Goold, 2004; Norris and McCahill, 2006). Often, working relationships and connections are crucial to the successful operation of open street CCTV networks, especially the relationship between control centres and the police (Home Office, 2007; Wilson, 2005). Research suggests that varied management operations and inadequate training can result in dramatic differences in standards across control rooms with many operators developing their own style of monitoring (Gill and Spriggs, 2005; McCahill and Norris, 2002; Smith, 2004; 2012).

One of the main ethical concerns about CCTV is that it could potentially be used for purposes other than criminal surveillance such as monitoring groups who have not necessarily done anything wrong, but are seen as a ‘nuisance’, ‘problematic’ or ‘unruly’ (McCahill, 2002; McCahill and Norris, 2002; Norris and Armstrong, 1999). ‘Moral panics’ are reactions to widespread fear concerning the appearance of an individual or group who become defined as a threat to society (Cohen, 1972). Lack of personal contact, the limitations of watching through a screen alongside cultural assumptions are the main

reasons for selecting surveillance targets through stereotyping (Hempel and Topfer, 2004; Klauser, 2007; Koskela, 2002; Surette, 2005). McCahill (2002) observes CCTV operators in a northern city shopping mall who target groups of youths with surveillance they see as ‘problematic’. Another example from Norris and McCahill (2006: 13) suggests that some operators do not necessarily base their assumptions on the behaviour of individuals, rather their appearance; ‘as one CCTV operator put it when asked if a suspect was banned, ‘if he’s looking really scruffy or he’s drunk, then we throw him out of the centre’.

Targeted surveillance could be construed as an invasion of privacy, therefore it is essential for robust privacy policies and legislation to guide the use of CCTV and promote best practices (Gras, 2004; Goold, 2010; ICO, 2017). Goold (2010: 28) argues that most people ‘expect to enjoy a certain degree of privacy and anonymity as we go about our business in public’. Crowded town and city streets are attractive to some as it gives people ‘the ability to lose oneself in the crowd’ (Goold, 2010: 28). Continuous monitoring in public spaces removes anonymity and this in turn effects how we live our lives (Lyon, 2001; Norris and Armstrong, 1999). The nature of public space CCTV undermines that anonymity and people who have an awareness of being watched will modify their behaviour to comply with societal expectations (Lyon, 2001; Norris and Armstrong, 1999). CCTV must only be used for the purposes identified as justification for the implementation of the system and should be open and transparent so that scheme operators can ‘minimise the loss of privacy and ensure surveillance is both lawful and appropriate’ (Goold, 2010: 31).

Critics argue that the presence of CCTV can deter crime, but will displace it elsewhere, however others believe that CCTV leads to more arrests (Newburn, 2017). Norris and Armstrong (1999) found that less than half of incidents which had been recorded as evidence resulted in arrests. Recent statistics also support these findings, some examples include; Dover - there were 1408 incidents and only 187 arrests (Dover District Council, 2017), there were 2384 incidents in West Lindsey, from which 97 arrests were made (West Lindsey Council, 2018). The reasons are wide ranging; working relationships, cultural, situational ideologies and operators' discretion are all variable factors (Norris and Armstrong, 1999; McCahill, 2002; Wilson, 2005). Goold (2004) found that some police viewed civic CCTV operators as incompetent. Smith (2012) found that some control centres were cutting back spending on staffing in response to the recessions. This resulted in unqualified, cheap labour forces being drafted in from agencies who were incapable of effective communication or decision making. Overstretched resources and high demand for police response can mean that incidents flagged by CCTV operators can go unattended (Honest and Charman, 1992; Gill, 2005; Goold, 2004). Gill *et al* (2005) found that working relationships between the police and CCTV operators are particularly strained during busy periods, for example on weekend nights when demand for police assistance is high. On the other hand, intelligence sharing, and community safety partnerships require close cooperation from both parties. CCTV is supplied as evidence and the police may conduct operations from external control rooms, thus strengthening working relationships (Gill and Spriggs, 2005; McCahill, 2002; Wilson, 2005).

Surveillance of an individual can only take place for as long as the individual is in a certain space (Gras, 2004). It is a legal requirement for scheme operators to display warning

notices (ICO, 2017), by entering a space under surveillance, it is the choice of the individual to be under surveillance. It is necessary to regulate how surveillance is conducted of those who willingly enter these spaces to ensure that systems are used both fairly and proportionately. The concept of consent itself is another issue – Alexander (1996: 165) argues that ‘valid consent must be full and free’. Public knowledge of the inner workings of CCTV networks is generally limited, with most references to the ‘support’ of CCTV citing its apparent effectiveness as a method of crime control (Coleman and Norris, 2000). Critics argue that consent cannot be truly given based upon publicly available information as very little is publicised about the inner workings of control centres and surveillance systems (Gras, 2004; Klauser, 2007).

The Human Rights Act (1998) states that British citizens have the right to privacy, including in public spaces. The Home Office maintains that CCTV policy in Britain is in line with article 8 of Human Rights Act, however this has been met with cynicism in Europe with sceptics suggesting that the use of mass surveillance is an infringement on human rights (Henderson, 2001; Taylor, 2002). The UKs surveillance network was established prior to the introduction of EU privacy and data protection legislation, it was a *fait accompli*, therefore any new legislation could only guide the fair use of CCTV for surveillance purposes rather than limit public space surveillance (Gras, 2004). Critics argued that earlier legislation was difficult to enforce as UK regulatory bodies simply lacked the resources to ensure compliance (Sanders and Young, 2000).

The Data Protection Act (1998; 2018) along with the General Data Protection Regulations (2018) determines how authorities and businesses can use and handle personal information. Personal information is a term used to describe anything that could be used

to identify an individual. This legislation applies to CCTV because images which could be used to identify individuals are routinely captured (ICO, 2017). The Information Commissioners Office (ICO) released its first Code of Practice in 2000 to address 'inconsistent standards adopted across different sectors at the time and the growing public concern caused by the increasing use of CCTV' (ICO, 2017: 5). The guidance promotes legal, open, proportionate and fair use of CCTV (ICO, 2017; Gras, 2004).

The Home Office issued a Surveillance Camera Code of Practice to provide organisations and authorities with appropriate guidance to using CCTV under Section 29 of the Protection of Freedoms Act (2012). The guidance directly acknowledges and addresses concerns about surveillance: 'The purpose of this code will be to ensure that individuals and wider communities have confidence that surveillance cameras are deployed to protect and support them, rather than spy on them' (Home Office, 2012: 3). The guidance is supported by the Surveillance Camera Commissioner who encourages voluntary compliance, although the Commissioner does not have formal enforcement or inspection powers (Home Office, 2012). The Regulation of Investigatory Powers Act (RIPA) (2000) was introduced to regulate how public authorities could conduct surveillance by introducing a system of authorisation to ensure surveillance is lawful, consistent and meets public authorities' obligations under the Human Rights Act (1998). *Northern Council's* CCTV cameras are only used for directed surveillance when RIPA authorisation is granted. Directed surveillance is covert surveillance in public places which is carried out with the intention of obtaining personal information.

The following example from McCahill (2002: 141) illustrates a typical pre-RIPA operation:

'they [the police] gave us a tape and we were taping it 24 hours a day on one channel. They were watching this house here (the security officer zooms in on a house across the road). The guy used to go out on a Friday night and come back on Monday morning and apparently what it was he was drug dealing so we caught him on camera. We were recording what time of the day and night people came in, the registration numbers of cars, what people looked like'

If the police approached a CCTV control room under similar circumstances today, they would require authorisation to conduct directed surveillance under RIPA. The CCTV operator would not be allowed to zoom in on the house or provide any detail about the investigation. Privacy legislation was introduced after most control room studies were completed; my research will attempt to illustrate how the legislation has shaped contemporary CCTV operations, how this has affected working relationships with external parties, and most importantly how the scheme operator ensures compliance.

3 Methodology

Background

My motivations for choosing this topic are not only the obvious need to bridge the gap in surveillance research or to introduce initial ideas about autonomous assistive surveillance technologies – I am personally invested both academically and professionally. I have over six years of control room experience and I am employed by *Northern Council* as a CCTV operator. I want to avoid the typical ‘effectiveness of CCTV’ and public opinion topics to gain a better understanding of the social processes within contemporary surveillance itself. I have noticed subtle changes to surveillance practices, operations and relationships triggered by numerous factors. I have heard many compelling stories about how things were ‘back in the day’ from my colleagues, some of who have worked at the SCC for 23 years. I want to investigate further by critically examining the development of public space CCTV from a criminological perspective to bring the story of the ‘electronic eye’ and its relationship with society up to date.

Solid comprehension and critical examination of existing research and literature is imperative before undertaking any form of empirical research (Hodkinson, 2008). The review process helps to formulate new and develop existing ideas and helps researchers to formulate efficient methods of data collection. There are very few recent UK studies concerning contemporary local authority control rooms. The few studies I did find during my initial research were largely focused on the retraction and decline of public space CCTV following the global financial crisis (Smith, 2012; iComply, 2013). In contrast, the SCC was never affected financially by the crisis and has significantly expanded and upgraded its networks over the past ten years. Part of my research will examine how the post-2008 recession has impacted the SCC, if not financially.

Insights and theories from earlier literature are extremely useful because they provide the context for situations, practices and sociological relationships at that point in time and provide grounds for comparative results (Bryman, 2004). The notion of the panopticon is over two hundred years old, yet it is still relevant to surveillance today. Many findings from earlier studies are outdated, however the results of some studies, especially McCahill (2002) and Goold (2004), are certainly still applicable to some elements of modern control rooms. I will use findings from these studies to shape the course of my research, by examining working relationships between SCC operators and external organisations (e.g. police) as well as the focus of day to day operations. As most control room studies were conducted prior to the introduction of surveillance legislation (e.g. RIPA) I will investigate the impact of legislation on operating practices and what its implications are for the 'maximum surveillance society'. The research will also examine technological developments designed to assist operators' day to day duties, this includes a relatively unexplored topic – fully automatic CCTV cameras.

Participants and Research Methods

The ten participants in this study are public space CCTV operators employed by *Northern Council*. They have varied experience – some have worked at the SCC for over 23 years, others commenced employment in the past five years. There were no issues when recruiting participants for the study. The SCC manager provided documents and information to assist my research. This included the CCTV feasibility study, historical newspaper articles and scheme information.

Qualitative research is largely directed by 'grounded theory', an approach which seeks to avoid systemisation to enable the development of new theoretical ideas through explorative research (Glaser and Strauss, 1967). Collecting empirical data helps

researchers to develop theoretical framework to explain social trends and change. To truly understand the impacts and underlying social processes of any given topic, further data collection through analysis must be applied (Glaser and Strauss, 1967). Generally, humans base the foundations of their understanding on their own thoughts and experiences. Interpretive processes and social interactions coalesce, forming valuable insight into the individuals beliefs and thoughts in specific aspects of social life (Blumer, 1969). Unstructured interviews were used to explore various topics while allowing flexibility to the questions asked. Questions can be phrased to suit the experiences of the participant and to explore certain ideas in more depth. Lofland (1995) believed that the essence of a research interview is a guided conversation. Surveys, questionnaires and structured interviews would not have been appropriate for this research. Unstructured interviews allow the motivations behind participants answers to be studied in more depth which is essential to get an accurate reflection of their perspectives (Fielding and Thomas, 2008).

It is arguably easier to retain focus on the intended investigation by following a semi-structured framework (Fielding and Thomas, 2008) but a greater degree of flexibility was necessary for this research. The experiences of participants in this study are varied and I am gathering information from over a 20-year period so semi-structured interviews would not have been practical. For instance, part of the research looks at the change from VCR recording to digital recording. The SCC moved to digital recording over ten years ago so it would not be appropriate to ask an operator with four years experience to recall changes in recording practices. To guide the interview process, I split the interview up into three sections: operations, legislation and technology. Only four questions were phrased in the same way to each participant:

1. How long have you worked at the SCC?

From when you started:

2. What kinds of surveillance equipment were here?
3. Were there any laws or policies directing how you could operate the cameras?
4. What kind of things did you use CCTV for?

Naturally, the personal values of researchers will shape the research process, particularly when 'grounded theory' is applied (Haraway, 1991). Grounded theory led research provokes deeper thought which is useful when exploring topics with limited relevant literature, but it is still essential to maintain macro-theoretical ideas as a basis for theoretical development (Bryman, 2004). I was aware that my own personal experiences and knowledge of the inner workings of the control room was likely to guide the research in some way, so I took extra care when phrasing questions to avoid projecting my own thoughts in the results. One example was when I was asking participants about their thoughts on police response to incidents. Instead of asking 'do you think the police take longer to respond to incidents?', I asked 'do you think there has been any change in police response times to incidents?'. Every effort was made to keep questions as neutral as possible, however as Seltiz and Jahoda (1962) point out, interview bias should be called interviewer differences, because interviewers are human, not machines.

All interviews lasted for one hour and were audio recorded, the data was then transcribed and interpreted. Considerations must be given to the potential impact of extraneous variables such as researcher bias, as previously discussed. I avoided paraphrasing when transcribing interviews to ensure impartiality when analysing the results. Following

transcription, data from each interview was grouped into analytic themes to identify initial ideas, this process is described by Strauss (1987) as ‘coding’. Themes and ideas from separate interviews were grouped, compared and contrasted into sub-categories where ideas were refined into the next chapter, results and analysis. Although the findings from this research will only explain how the SCC has developed over the past 23 years, some of those findings may be generalisable to other UK public space control rooms and can help to explain some of the changes, reasons and applications behind technical, legislative and operational changes in contemporary public space surveillance.

Ethics

In the early planning stages, I consulted the SCC’s Service Manager and Operations Manager about my ideas, both were supportive and agreed to allow the research to take place at the SCC. Interviews were conducted in an office adjacent to the main control room at the SCC. There were two reasons for this: Firstly, the control room is a very busy environment and it was likely that interviews would be intermittently interrupted. Secondly, the interviews were audio recorded and there are audible radio transmissions and telephone conversations in the control room.

Confidentiality and data protection are the most important aspects of this research. For data protection reasons, any details which could be used to disclose the location of the control room, incidents, the identity of the local authority, its partners and employees (except for myself) have been replaced with pseudonyms or redacted. This includes references to local newspapers and documents provided by the SCC. I decided not to disclose geographical information as some of the findings of this study could potentially damage relationships between the SCC and external agencies. Participants responses were anonymised for both ethical and data protection reasons.

In accordance with ethical guidelines, all information obtained during the interview process was based on informed consent. Operators were provided with a briefing sheet detailing the nature and purpose of the research and were asked to return a signed consent form within two weeks if they wished to participate in the study. Participants were made explicitly aware of their right to withdraw from the study via the briefing sheet. They were also reminded of their right to withdraw at the start of each interview. Participants were encouraged to provide as much detail as they could but were informed that they did not have to answer or provide reasons for not answering questions they did not want to answer. Furthermore, participants were asked not to disclose any details concerning ongoing incidents or investigations. Participants were de-briefed after interviews and given ample opportunity to ask questions at all stages.

4 Results and Findings

Part One: The Security Control Centre

The Security Control Centre is a purpose-built secure unit attached to three residential tower blocks which were formerly owned by *Northern Council*. When it opened in 1996, telecare monitoring staff from *Town A* and *Town B* were merged into one unit to monitor both telecare and public space CCTV. Vehicle access is gained via a remote-controlled electronic gate, opposite is a CCTV camera programmed to automatically detect and track movement. There are eight static cameras on the outside of the building which cover the pedestrian walkways and entrances. The automatic camera follows as visitors exit their vehicle and enter the building, firstly through a keyfob controlled door into an ‘airlock’. The next door is the entrance to the SCC itself, which can only be opened from the inside by releasing the maglock.

A large blue desk is wrapped around two walls set back three feet from a grey laminate panelled floor-to-ceiling ‘video wall’ unit. The video wall comprises 20 42” HD monitors which display video feeds from all five towns. Some monitors display grainy feeds from the sixteen remaining analogue cameras, the others show sharp digital images. One monitor can be viewed remotely by staff in *Northern Police Force’s* Command Hub (*CH*). Behind the video wall there are six server units which receive, and record video signals transmitted from the 228 CCTV cameras installed around the region. There are three monitoring stations on the desk, comprising three 22” monitors, a computer and joysticks. Two monitors are used for CCTV operation; the third is for general computing needs (e.g. email and internet access) and handling telecare alarms. Each workstation has two telephones – one for general calls and the other for telecare and lone worker

emergency calls. A fourth workstation, seldom used by operators on shift, is installed at the end of the desk:

‘The station in the corner isn’t used much by us, it’s no different to the systems we have on our desks but it’s mainly [used by] the engineers and sometimes police reviewing footage for themselves.’ (Participant 8)

Two computers monitoring fire, panic and intruder alarms are situated between the operators’ workstations. Nearby, there is a digital ‘Shopwatch’ radio receiver which enables operators to communicate with security officers and staff in *Town A*’s shopping precinct and high street alongside a *Northern Police Force* issued ‘Airwaves’ radio. Several smaller rooms are attached to the control centre itself: staff welfare facilities (kitchen, bathrooms, locker room) and two offices used by management and telecare installation staff. Some participants started working at the SCC prior to its major refurbishment in 2014:

‘Things were more or less arranged the same as they are now, except the airlock door was a few feet to the left and we had a video tape eraser machine in the corner and shelves full of videos. The cupboards under the video wall were glass and full of recorders and multiplexers.’ (Participant 1)

‘The video wall was wooden, the desk was wooden, there was wooden panelling everywhere, very 80s style. The monitors in the video wall were really small, a couple were black and white.’ (Participant 3)

Although the SCC is a purpose-built surveillance centre, CCTV is not at the forefront of the operations and this, along with strategic cost saving measures, has helped it avoid the

recession related problems faced by other UK control rooms (iComply, 2013). Telecare services are prioritised for two key reasons:

‘Telecare is the priority, we’re answering that regardless of what’s going on elsewhere, it’s for two reasons, the first being we have a duty of care to the service users and the person activating that alarm could be having a heart attack so we need to make sure they’re safe... the other reason is telecare pays for this whole place, we’ve got over 4,000 service users.’ (Participant 9)

‘I remember seeing the news about Lincoln 10 years ago, they were going to turn the CCTV off because they couldn’t afford it. If we didn’t have other services that could’ve been us.’ (Participant 2)

Equipment is utilised for as long as feasibly possible, there is a delicate balance between cost-saving and system efficiency. Upgrading equipment is expensive but can save money in the long run, for instance replacing VCRs with digital recorders cuts out the cost of tapes, upgrading from BT networks to wireless removes line rental costs. Despite digital recording being widely available from the early 2000s (Keval, 2009), it was only introduced to the SCC in 2006 when the original equipment became obsolete and unattainably expensive:

‘It got to the point where we couldn’t get parts to repair the hardware and we couldn’t get video tapes and when we did, they were a tenner each, we went through about 500 every 10 months. It was expensive so the Council being the Council said to *Engineering Company* this is how much money we’ve got what can you build us?’ (Participant 4)

‘We have been upgrading the cameras gradually since 2014, we couldn’t afford to upgrade everything at the same time.’ (Participant 3)

‘We use what we have until it’s un-usable or too expensive to repair and has to be replaced. We only upgrade if it’s going to be efficient in the long run, we’ll use high quality kit because it lasts longer. The control centre got to the point where everything was becoming obsolete, it really needed modernising. It was renovated in 2014 with major project funds from the council.’ (Participant 1)

The SCC also generates income by providing services for other *Northern Council* departments. This includes CCTV and domestic violence alarm monitoring for Safer Neighbourhoods and fire, panic, lone worker and intruder alarm monitoring for various departments and *Housing Association*. It also handles out of hours emergencies for Highways, Maintenance, Housing Advice, Registrar, Parking and Environmental Health.

Part Two: Operators

There are five teams comprising two operators and one supervisor working a ten-day rotating shift pattern: two days (07:00-15:00), two nights (23:00-07:00), two rest days, two evenings (15:00-23:00), and two rest days. Additional staff including two managers, administration, and telecare officers work office hours Monday-Friday. Up until four years ago, there had been very little change in personnel:

‘Most people who worked here originally stayed for a long time, we’ve taken more than we have in years over the last three years or so but that’s mostly because people have had to retire through ill health. We ended up with a staffing crisis.’ (Participant 2)

In contrast to Smith's (2012) findings, cheap labour and an unqualified workforce is not an issue within the SCC. Most of its operators are ex-police and security staff; others have transferred from other *Northern Council* departments. The Operations Manager has over twenty years of experience working with surveillance. Operators must be able to demonstrate knowledge and experience of safeguarding, surveillance and data protection regulation prior to commencing employment. New employees complete six months of training with proportionate surveillance and safeguarding as the core focus. All operators regularly complete e-learning and have quarterly employee development reviews alongside opportunities to attend internal *Northern Council* courses.

'I've been on a couple of courses, they did a course that helps you to talk with suicidal people. We do courses if there's new legislation or policies, the last one was for GDPR we had to do e-learning and pass an online quiz.' (Participant 10)

All members of the SCC team have recently received a significant pay rise with some operators' salaries increasing by more than 10% as part of *Northern Council's* implementation of a new nationalised pay scheme. Operators also receive additional night-time, bank holiday and weekend working allowances. *Northern Council* will assist with health and wellbeing needs where appropriate and there is strong support from management:

'If we see something traumatic like a suicide, they will offer us counselling. Your eyes get affected by the screens eventually so they'll give you so much towards eye tests and glasses.' (Participant 2)

‘Our manager has been here since it opened, if there’s ever any problems, regardless of what it is she will do her best to sort it. She’s very supportive of us all.’

(Participant 7)

None of the operators in this study have ever had their personal safety compromised by work related incidents; however they are afforded a degree of anonymity as an exercise of caution:

‘We don’t have to give our full name out to anyone, just your first name. It’s not a dangerous occupation but some of our evidence has sent people to prison for life, some people can be pretty vengeful.’ (Participant 4)

Part Three: Communication and Mobilisation

The SCC has established working partnerships with the police, fire brigade and ‘*Shopwatch*’ scheme members in *Town A*. The partnership with *Northern Fire Service* is part of the SCC’s TSA (Telecare Services Association) accreditation, however information sharing about other operations in the SCC is commonplace:

‘The fire brigade partnership is mostly telecare related like safe and well checks for fire risks in houses, but we give them our CCTV lists too so they come to us for footage sometimes.’ (Participant 6)

Most CCTV work relates to policing in some capacity. An ‘Airwaves’ radio and video link connects the SCC to *CH*. There have always been direct links between the two control rooms, but the current links make communication easier and more effective:

‘We had a red phone before that went straight to *CH*, the radio is better because we can hear what they’re doing and all the police can hear what we’re saying so we can

monitor if we've got camera coverage and they can respond if they're near something we spot. If we hear they've found an old dear wandering around confused we can check on telecare to see if we've got any info.' (Participant 4)

'The video feed lets *CH* see what's going on so we don't have to take up the Airwaves explaining and they can dispatch the officers faster. Senior police can see it too so if it's a major incident they can control the police on the ground directly. If something has just happened we can just replay the footage to them.' (Participant 8)

The video link was upgraded in May 2019. It enables operators to send video feeds from all cameras through to the police, previously only analogue feeds could be shared.

'The link needed upgrading for a long time, we could hardly show them anything as we've not got many analogues left, but it was all down to money, the police wanted it but didn't want to pay for it, we wanted them to have it but we didn't want to pay for it. In the end we just paid for it.' (Participant 2)

Despite improvements in communication links, interpersonal communications between SCC operators and *CH* are not always positive. Like Gill's (2005) findings, operators reported having difficulty communicating incidents and mobilising a response during busy periods, particularly on Friday and Saturday nights:

'You struggle to get in on the radio on weekends, if there's a fight or something happening you need them to go right away. Most of the time they're busy dealing with domestics, they try to have a car in the town centre for NTE but it never happens they're too busy.' (Participant 5)

‘We had a stabbing in the high street and I just kept pressing the button until I finally got in, then it took them 20 minutes to get there.’ (Participant 1)

Professional relationships are sometimes strained by presumptions of incompetence (see Goold, 2004). SCC operators feel that the police do not always take their incident reports seriously:

‘I saw this kid standing on a mobility scooter riding it down the middle of *Town A* high street at 2am and then he goes into the car park and meets another bloke and they’re shoving it into a transit van. I put the video through, reported it on the radio... *CH* said to me ‘what makes you think it’s stolen?’ It’s just the lack of respect, we have operators with over 20 years’ experience, half of us are ex-coppers.’ (Participant 3)

‘I called them to a group fighting; I’d seen a couple with knives. Police showed up, they scattered and the next thing we hear is ‘we’re resuming, there’s no offences’ although they had a description and direction of travel of a guy who had a 6-inch blade on him.’ (Participant 7)

‘They’ll ask if we have cameras somewhere we don’t have them, we’ll say no and then they’ll tell us we do because their mapping system says so. If they bothered to look at the camera lists we send they could update their mapping system.’ (Participant 2)

Some operators believe that some police officers lack basic knowledge and understanding of the underlying processes and functions of CCTV, which is somewhat concerning, yet reflective of the limitations of general public understanding (see Klauser, 2007):

'This guy sent a footage request, no details, so I emailed back and asked him what he wanted, he then replied six weeks later with the details, by that time the footage was overwritten and he said 'I'm sure the victim will be very disappointed' like it's my fault CCTV isn't saved indefinitely and it took him six weeks to reply to an email.' (Participant 5)

'Some of them think they can just walk in and get footage, they get annoyed when we send them away because we've got no request in writing. They think we are there purely to serve them. They don't pay towards our system and CCTV isn't even our priority.' (Participant 8)

'The number of coppers who ask me to zoom in and sharpen up past footage... No, this is not CSI.' (Participant 3)

'We send them lists of cameras, but I don't think they look at them, I just wonder how much evidence is missed because they don't think to check with us.' (Participant 10)

'There's times when they've come in and basically asked us to breach RIPA. A recent example is a woman who wanted us to keep tabs on the prostitutes on *West Street* and tell her who was there at certain times. We told her to get a RIPA, she wouldn't, or couldn't and kept pushing. They're meant to know the law.' (Participant 4)

In contrast, some interactions are more positive and help to strengthen professional relationships:

‘The local coppers take the nuisance everyday jobs like ASB in the multi-storey more seriously. They’ll visit and tell us what’s been happening in the town centre so we know what to look out for, we tell them the problems we see.’ (Participant 6)

‘Detectives and investigating officers tend to spend more time with us, they usually want long reviews and they know we don’t have the resources to spare someone for hours on end so they come and learn how the system works and do it themselves. We get on, we make them a drink and have a laugh.’ (Participant 1)

‘Sometimes we have them here on RIPA operations, the last one was in *Town A*. They did the monitoring themselves and said if we needed those cameras while they were on them, just take them.’ (Participant 3)

Nationwide financial cuts to public services during the recession have undoubtedly impacted on the police’s ability to respond to incidents. One of the primary functions of CCTV is to mobilise a response to incidents in progress, but operators report that it has become increasingly difficult to mobilise police response. This is not only down to a reduction in policing numbers, but also because *Northern Police Force’s* custody suite has been relocated 22 miles away from *Town A*:

‘There’s no police to go to anything anymore, they used to have a car parked up in the town centre all weekend but they just don’t have the resources. It’s hard to get a response to serious problems sometimes, it’s not their fault or ours, we just try and get as much evidence as we can and deal with it later.’ (Participant 8)

‘The police are reluctant to make arrests for public order offences, especially on weekends, it’s since they moved the custody suite. If they arrest someone they’ve

got a 40 minute drive, plus a couple of hours for processing and that takes a unit away from *Town A* and they're overstretched as it is, we're lucky if we get four units for the whole county sometimes. They end up dropping people off home and sometimes you'll hear that person has started kicking off there so they have to go back out again. The fault lies with the organisation of the police force, not the officers.' (Participant 3)

The SCC operates a '*Shopwatch*' and '*Pubwatch*' radio system which is used by security officers, retailers and local police to pass information about issues in the town centre such as shoplifting and violence. Similar schemes are described in McCahill (2002) and Smith (2012). Operators reported in recent years, the radio is often used by the SCC to mobilise a response to minor incidents that the police do not have the resources to deal with.

'If there's someone causing problems, the description gets passed round and they aren't allowed into other premises. If the radio users listen and act it can save police resources.' (Participant 8)

'Safer Neighbourhoods pay for a couple of guards to wander round the NTE to help with public order. If we've got kids in the car park with minor ASB offences it's difficult to get the police there because that isn't a priority for them. Sometimes the security guards will attend and move them on for us.' (Participant 2)

'If they get someone violent, they shout up and we radio the police right away. The PCSOs carry a radio too so if they're about they'll go straight to anything anyone puts on the radio.' (Participant 6)

Despite the advantages, operators took issue with the 'lack of professionalism' amongst radio users.

'There's this guy who is just ridiculous, he's shouting stuff like 'CCTV there's a man working on a roof with no hi-vis'.' (Participant 7)

'They expect us to radio police to non-emergencies like a shop theft that happened an hour ago.' (Participant 4)

'They ask us to ring ambulances without telling us anything. When we're trying to get details we get no reply.' (Participant 10)

'You'll be talking to one shop and an overly keen security guard that has nothing to do with it just interrupts your conversation.' (Participant 2)

'Someone said a racist comment on the radio, a formal complaint was made. We read out a warning notice to users and the person was reported. If there's serious misuse of the radio Safer Neighbourhoods will take it off them.' (Participant 9)

Communication networks enable operators to select targets for surveillance. In contrast to findings from McCahill (2002) and Norris and Armstrong (1999), operators reported that targets were selected based on local knowledge, intelligence and prior experiences rather than stereotyping:

'The same names come up a lot for shoplifting, mispers, groups fighting... This is a small area, everyone knows everyone, so if we see someone we know to be a shoplifter near the shops, we follow him and tell everyone on the radio he's there. If we see a group of kids that smashed up the car park last week, yes we'll follow

them, but I wouldn't follow someone because they were black or wearing trackies.'
(Participant 8)

'We don't profile people, we know who the troublemakers are, we can hear on the radios where the problems are, we know who we are looking for, we get intelligence from the police, Safer Neighbourhoods, the precinct, everywhere.' (Participant 2)

Part Four: Technological Development

a) Recording and reviewing evidence

From 1996-2006 camera footage was recorded to VHS tapes. There were 16 recorders and each tape would store 24 hours of footage from 9 cameras. Tapes would be stored for one month before they were magnetically erased. There has been no change to the length of time footage is stored for; according to *Northern Council's* CCTV policy footage is stored for one month unless there is a need to keep it longer for the purposes of assisting an investigation. The processes for maintaining and reviewing evidence were more complex than they are today:

'At 6am we'd change all the tapes. We'd have to stop the recorders and rewind the tape so we would have 2-3 minutes where cameras weren't being recorded. We would use each tape 10 times because they degraded after so long as we had to magnetically erase them.' (Participant 2)

'Digital recording made a massive difference to the amount of time spent reviewing. There were 9 cameras recorded per video tape for 24 hours so we'd have to find the right camera, record, press pause, finding the next tape and repeating. You'd be sat there with a pile of tapes just to do one incident. Everything is in one place with digital recordings.' (Participant 1)

The memory capacity of the digital recorders has had to be increased over time to compensate for both the number of digital cameras and the size of the video recording files. The original digital system had around 10TB of memory to record a month of footage from 16 cameras, the current system uses around 120TB per month. Most cameras connected to the SCC are HD 1080p or 4k. 1080p cameras typically run at 25-30fps (frames per second), with 4k running even higher. The more frames per second, the clearer the images (Keval, 2009). According to statistics provided by the SCC, on average 62% of police footage requests had a positive result in 2017/18. Operators believed that footage now is of more evidential value than it was when analogue systems were in use:

‘If we recorded from the spot monitor it was much clearer at a higher frame rate, it was the ultra HD of its time. The tapes in the recorders would have a much lower frame rate. If we were reviewing something we hadn’t seen in real time the evidence wasn’t much use because the pictures were so blurry, obviously that isn’t the case now. The image quality is brilliant.’ (Participant 3)

When footage is requested by the police, operators save it to a hard drive and burn it to a DVD or portable device. Operators thought that DVDs, like VHS tapes, are becoming obsolete and are an unnecessary cost:

‘You can get about 4GB on a disc which is about 4 minutes of footage for some of the newer [4k] cameras, but you can get over an hour off the analogues. If the police want a big job doing like a murder they have to bring their own hard drive for us to download it straight onto. They have over 250GB for the last one. (Participant 9)

‘It costs us too much in time, resources and DVDs to be sitting there burning 10 or 15 discs for one job. Safer Neighbourhoods put their own hard drive in here now for us to save stuff to as and when, they can just take the whole thing away with them then.’ (Participant 8)

Technological developments have helped to cut down the amount of time spent reviewing footage and increased the usefulness of evidence, although all new technology has a downside:

‘It takes longer to save files on the newer cameras. The analogues download in a fraction of the time. If we’ve got hours to save we use the spare workstation so it’s out the way.’ (Participant 10)

b) Using the system and practical CCTV installation

Operators can integrate their knowledge of the area and operations through personalising settings in the VNR software. For instance, operators can make their own camera position ‘presets’ for IP digital PTZ cameras in areas with frequent problems. This helps them to respond to ongoing incidents faster, thus obtaining footage which is of more evidential value:

‘We can use presets to get things on camera faster... on camera 201 there’s a preset position for different pubs so on a Friday if it’s looking down the high street and I hear on the radio it’s kicking off at Bluebell, I can just press number 3 on screen or joystick and the camera spins round and looks at Bluebell. If you try manually moving the camera round it takes longer and you might miss something especially if it’s a fight... if there’s arrests the police want to know who started it.’ (Participant 10)

These features also enable a degree of autonomous surveillance:

‘Some of the cameras are left on tour when we’re not using them so they’re constantly moving about and looking different directions... you just tell the camera to look at its presets for x amount of minutes and move round them.’ (Participant 4)

When cameras are on ‘tour’ they cannot always view the entire area and could miss incidents. Operators reported that they were asked for feedback when cameras were due to be upgraded. This means that the system can be used more efficiently as the everyday users experience its limitations. *Engineering Company* have recently replaced frequently used analogue PTZ cameras on *High Street* and *North Road* in *Town A*:

‘There’s always something happening on 7 and 118 so they replaced them both with four static cameras with a 4K PTZ on top so we can see the whole area all the time. They’ve done it with a couple of others elsewhere so we can watch car parks and streets at the same time.’ (Participant 8)

In-built camera features also help with live tracking and monitoring:

‘The cameras all have autofocus now which is easier when you need to zoom in on something happening quickly. The couple of seconds you might take switching between zoom and focus on an analogue might mean you miss something especially if it’s a fight or if you’re trying to get a VRN.’ (Participant 4)

Although, autofocus does have its disadvantages, particularly on the newer 4k cameras:

‘At night the autofocus does not like lights and it can get frustrating when you’re trying to follow a fight or something outside a pub and the footage ends up being intermittently blurry. *Engineering Company* are experimenting with the settings to see if they can improve it.’ (Participant 6)

While autonomous and personalised features are helpful to operators in carrying out their duties, some were critical of the newer systems:

‘Every time they upgrade it gets worse.’ (Participant 3)

Most operators preferred to use the older control systems as they found it was ‘quicker and easier’ to navigate the CCTV network:

‘In the 90s we had this big Atari-style console with two joysticks on it – one was for moving the camera around and the other one was for zooming and focussing but you could move, zoom and focus at the same time... then they gave us the ZoneVu controller which only has one stick. You have to press the button on the top to switch between zoom and focus and that takes longer than the previous one... and now we’ve got the USB joysticks and cameras with autofocus which don’t work properly.’ (Participant 1)

‘It’s quicker to skip between cameras on the ZoneVu, you just put the number into the keypad and it appears on your analogue screen. You can’t do that with the new ones, you have to select it from the list on screen and it takes longer. I don’t bother with the joystick, I just use the mouse as I’ve got to use it to pick my camera.’ (Participant 7)

‘When we opened we had cutting edge tech. We beta tested a touch screen map which had all the cameras on it. You’d tap the icon and it would load the video onto your spot monitor. If you were following someone you just tapped on the next bit of the map in the direction they went in and tapped the next camera. We lost the touch screen after 5 years as the licence came up and they wanted a ridiculous amount of money for it. We could still use the mapping system with a mouse. We don’t have any mapping at all now, what was left of it went with most of the analogue equipment after the electrical in May.’ (Participant 3)

c) Network Expansion and Camera Improvements

Northern Council opted for a fibre network for its original network as images were more stable and it provided flexibility for future expansion. Graham (2001) predicted that CCTV networks would extend to smaller towns and villages as technology developed. Developments in wireless IP technology allowed *Northern Council* to extend its CCTV network to include other towns in the county in recent years. In 1999, *Town E* formally enquired about installing a small CCTV network which would be monitored by the SCC (Paper, 1999). It was not cost-effective to install a camera network in the town as there was no existing fibre cable network at that time and the distance from *Town A* was too great to establish stable microwave links. However, in 2013, a £24,000 wireless IP network comprising three CCTV cameras was set up in *Town E* marketplace and town centre. The cameras communicate with a transmitter installed on a building with line of sight to a receiver on top of a tower block in *Town A*.

In 2014, *Town C* and *Town D* established small networks of HD digital cameras. Camera signals travel to receivers on buildings with line of sight to the receivers installed on top

of one of the towers on *Local Landmark*. Signals are then transmitted from *Local Landmark* to a receiver atop a tower block in *Town A*. At the same time, a handful of cameras in *Town A* were upgraded to HD digital. Since then, more cameras have been upgraded in *Town A* and *Town E* and a digital network has been established in *Town B*. Unlike *Town C* and *Town D*, the buildings with receivers in *Town A*, *Town B* and *Town E* have direct line of sight to the tower block so there is no need to bounce the signals to and from *Local Landmark*. The most obvious difference between the analogue and digital cameras is the quality of the images:

‘When we first had *Town C*, *Town D* and 201, 202 and the others installed, the image quality seemed amazing. It’s still good now, but the 4k cameras are even better. You can see the colour of someone’s eyes from a quarter mile away’
(Participant 7)

Operators reported issues with intermittent signal transmissions from digital cameras. Sometimes there are gaps in recordings and video feeds become ‘slow’ or ‘drop out’ entirely rendering them unusable. Similar issues are discussed at length by Keval (2009). Most participants believed that the problems were only temporary because the SCC is in its final stages of its full digital transition.

‘We’re changing everything to digital and have massively expanded our network, it’s almost finished but there’s still some way to go. The technology is more complicated so the problems are complicated. *Engineering Company* do some troubleshooting and setting adjustments.’ (Participant 1)

'Northern Council spent several million on a brand new market this year so now we look after 40 odd cameras in there, plus we upgraded all but one camera in *Town B* to digital and a few more in *Town A* and we've had the big electrical upgrade in May... this has all happened in the last couple of months so there's a lot of extra traffic coming in on the system. They've put extra bandwidth in and replaced some bits of network kit and they're going to upgrade the software at some point. *Engineering Company* said that should sort the lag problem out.'

(Participant 8)

Smith (2012) found that malfunctioning equipment was one of the most frustrating aspects of CCTV operation. Signal issues on weekend nights during the NTE hours (18:00-06:00) in *Town A* and 'broken' footage timelines emerged as the two most frustrating problems for operators to encounter. Examples include:

'When a camera has dropped out or gone slow for whatever reason, you end up missing stuff that's straight in front of it and it's really frustrating. At least with the analogue cameras you know they're not going to randomly go offline.'

(Participant 7)

'Nothing annoys me more than when you're reviewing footage and there's a gap when it's stopped recording for whatever reason, even if it's a few seconds you know it's gonna be the few seconds of footage you actually need.'

(Participant 3)

'Sometimes the camera might become unresponsive, or you'll tell it to move and then it decides to do it 10 seconds later and starts spinning round, it's frustrating.'

(Participant 8)

Most of the issues experienced with digital cameras are temporary and can be resolved remotely by *Engineering Company*. Interruptions can be caused by several things:

‘The problem is everyone uses 5.8 GHz channels now, so in places like the town centre you’re going to get the odd interruption because there are a lot of open public Wi-Fi channels. If there’s a conflict, the equipment will automatically switch channels and that can make it go slow or give you gaps in the recording for a short time while it’s finding another channel, if it can’t find a channel it’ll drop out until it does. Sometimes there are issues when the signals are bounced back from *Local Landmark* because the police and everyone else have their receivers and transmitters up there too. Sometimes buildings with the receivers on lose power, like the church in *Town B* the other day... We could get our own private channels on a 60GHz light licence and that would probably resolve most of the problems we have, but then we would have to pay so much per camera which defeats the purpose of saving money.’ (Participant 10)

Sometimes, issues are caused by external parties who may not understand the inner workings of the CCTV networks:

‘One time in *Town C*, we couldn’t use the cameras because the Christmas lights were interrupting the signals. We’ve had to tell them to move the decorations on *North Road* in *Town A* before too.’ (Participant 3)

With developments in wireless technologies come further complications:

‘Ofcom have set channels used specifically for weather satellites. If you’re using equipment made in the UK it’s not an issue as the dynamic frequency settings are

pre-programmed so they don't jump onto Ofcom's channels, however we have been using some equipment from Ireland which jumped to their channel. They told us, we sorted it right away, but you could end up in prison or with a fine.'

(Participant 9)

d) Automatic Motion Detection

A relatively unexplored area of new surveillance technologies is how automated cameras can assist operators with their duties. The SCC monitors two cameras which are programmed to detect and follow moving objects. One is opposite the SCC's gate and another is installed on the top of the multi-storey car park in *Town A*. The camera was installed in 2018 in response to high levels of ASB and public safety concerns:

'We already had 40 static cameras in the car park, then the ASB got worse. We were constantly seeing kids climbing walls but couldn't follow them with the statics, so we got a PTZ and *Engineering Company* put some software on it. If it sees an object moving, it will automatically zoom and follow that object for a set amount of time unless we over-ride it. When you play the footage back it looks like one of us has been controlling the camera.' (Participant 4)

'It's really useful if we have a review – if we have missed something up there, chances are the camera hasn't.' (Participant 2)

The cameras are displayed on the video wall as it helps draw operators' attention to incidents in progress.

'You can see it in the corner of your eye, when it starts moving it catches your attention. Sometimes it'll be nothing, like a car leaving, but I've spotted people

standing on the edge of the fourth floor with that camera, it's saved a life or two.'
(Participant 10)

The placement of the cameras is important, because the technology is not suitable for all environments:

'It would be no use on the high street, there would be too many moving objects. It works at the car park because it's a confined space.' (Participant 2)

As with most technology, there are also cons:

'I call it pigeon cam, because it follows pigeons. It spins round when it rains and it follows spiders.' (Participant 3)

An unexpected finding was that the automatic camera provoked social interaction from the observed to the observer.

'It seems to entertain the youths. They'll see it tracking them and they're waving and smiling at it, they run round trying to get it to follow them, they obviously think it's us doing it. Some throw things at it, but then they just end up getting arrested. Generally if they're up to no good they run off when it starts moving so it does its job, despite its entertainment value.' (Participant 10)

Part Five: Legislation and Operations

Developments in technology have made it easier to collect personal data; therefore it is necessary to regulate how data can be lawfully used. Concerns about mass surveillance have undoubtedly influenced legislation governing the contemporary use of CCTV. To understand what this means for CCTV operators, participants were asked to describe

what, if any, effect data protection legislation has had on their working practices. One participant who started working at the SCC in 1996 explained:

‘I don’t think data protection has changed much for us. Right from the start we’ve always had things in place like nobody unauthorised gets to come in here, nobody gets to see our footage unless the police release it, we’ve always stored mugshots and intelligence securely, we’ve always destroyed notes at the end of the shift, we won’t give any information out over the phone, we destroy footage as soon as it’s no longer required, we don’t pass numbers ... you get the idea.’ (Participant 3)

As the most recent data protection legislation (GDPR and Data Protection Act, 2018) was introduced just over a year ago, all participants in the study were able to describe minor changes to the way information is handled internally, but there has been very little change to operational procedures:

‘In the early days the coppers could just ring us and say what they were looking for and we’d find it and save it for them. They wouldn’t have to put the request in writing but they had to sign for the footage and we have always kept an audit trail before any laws came in, it’s just good practice. When the data protection stuff first started coming in they’d have to fill in a Section 29 DPA form instead of ringing us. It’s no different to now, if we don’t get a request in writing, no footage. I suppose the only difference is they send the requests by email so it gets to us faster.’ (Participant 1)

‘We use guidance from the ICO and surveillance commissioner to make sure we’re doing best practice but I can’t recall any significant changes to what we can and can’t do, other than having different forms to fill in.’ (Participant 8)

Data protection legislation has impacted upon operators’ exchanges with members of the public. All operators thought that the average member of the public did not fully understand what constitutes personal information and how this information could be shared.

‘We’ll get people ringing up saying stuff like my bikes been nicked I want the footage, we can take the details of the incident and save the footage but can’t give it to them. They have to go through the police or their insurance. You can put a FOI request to Information Governance but you won’t get the footage because it’s got other people’s information on it and we don’t have people to sit and blur out faces.’ (Participant 5)

Sometimes, this leads to heated exchanges:

‘I had this guy ring up demanding footage of his car parked in a car park. He starts swearing at me and tells me he is entitled to the footage because it’s got his car on it, I explained that his car isn’t personal data and he blew his top. I just told him to submit an FOI which got declined.’ (Participant 6)

The Regulation of Investigatory Powers Act (2000) was introduced to control the way public authorities could use surveillance to gather information (ICO, 2017). The SCC is only used for directed surveillance and has been involved in 7 RIPA operations over the

past two years. Participants who worked at the SCC before RIPA was introduced were asked if there were any safeguards in place to prevent unnecessary invasions of privacy:

‘The Council always took privacy really seriously. I remember when CCTV was getting popular and people started worrying about being watched, so when we were setting up our scheme they were always open with the public about privacy and how we use cameras. There was a lot in the paper about it at the time.’ (Participant 3)

‘From the day we opened we were told don’t follow people for no reason, don’t zoom into houses, don’t watch your mates on the street, don’t follow a pretty girl round, don’t invade people’s privacy, they put it all in the CCTV policy. We’ve always had privacy blocks too. If there’s a camera close to a house you can’t avoid looking into when you move, a black block appears over it as you pan round.’ (Participant 1)

Following the introduction of RIPA, *Northern Council’s* solicitors consulted SCC operators to explain the impacts of the new legislation on surveillance:

‘After the meeting I remember my exact thoughts, so nothing has changed much, we just need to make sure what the police want us to do is lawful. So if they ask us to watch and see where a man goes at 7am every Monday, they need to present us with a RIPA authority first.’ (Participant 3)

An example of authorised directed surveillance:

The first RIPA I worked on was about 5 years ago in *Town D*, the police were watching a house for drug dealing so we had a camera pointed at the front door for a couple of weeks so they could observe it.’ (Participant 5)

Operators reported that RIPA did not change much in terms of how they used the cameras as directed surveillance is only conducted upon police request. The primary concern is ensuring the police have lawfully secured authorisation.

‘At the time it came in, our biggest challenge was getting the police to bring the right paperwork. We’ve turned a lot of requests down, it’s not so common now but it still happens.’ (Participant 3)

‘It’s amazing how many police officers don’t know they need RIPA authorisation. We were approached by one wanting us to see if a man got picked up at a certain time in the morning for a few days on *North Road*, she was adamant she didn’t need a RIPA, or couldn’t get one, either way she got nothing from us.’ (Participant 2)

‘Got an email last week asking us to leave the *South Road* camera on a house because of unspecified problems. No RIPA, no surveillance.’ (Participant 7)

Operators were asked if the focus of surveillance operations had changed much in the time they had worked at the SCC. Most of the issues with homelessness, youths and drunks highlighted in the feasibility study (1995) are still prevalent on the streets of Town A with the exception of vehicle crime. Local Newspaper (1997) reported a 54% reduction in vehicle crime after the first year of installation. None of the participants could recall a

vehicle theft from a public car park in the past five years, although Newburn (2013) points out that contemporary vehicle security systems have significantly improved.

‘The car theft stopped, everyone knew the cameras were there. I can’t remember the last time a car was stolen under our watch.’ (Participant 3)

The amount of time spent monitoring shoplifting has also reduced, this is largely attributed to the retraction of CCTV in *Town A*’s shopping precinct:

‘We don’t deal with as much shoplifting now because the precinct security put their own cameras up and took the ones we were monitoring for them over in 2014 when they got their own mini-control room.’ (Participant 5)

Issues with anti-social behaviour and begging are still prevalent. The lack of police resources has led to closer working relationships with Safer Neighbourhoods who have taken responsibility for following up on minor ASB incidents in the first instance:

‘The biggest problem now, probably ASB in the multi-storey, groups of kids smashing windows and throwing things off, half the time the police can’t get there because they haven’t got anyone.’ (Participant 2)

‘ASB and begging on the high street and multi-storey is constant, what we’re doing now is saving all the footage to a HDD and giving it to Safer Neighbourhoods. They take the pictures to schools and ID the kids and send warning letters, they can issue Section 59s to anti-social drivers and give the beggars CPOs.’ (Participant 8)

Many contemporary operations of the SCC are focussed on care rather than control; this has largely been influenced by changes to contemporary policing and an emphasis on safeguarding.

‘The police are always giving us descriptions of missing people. The hospital isn’t far from the cameras in *Town A* so we get a lot of concerns for safety when people wander off. There’s also a psychiatric hospital and we get suicidal patients going up to the top of the multi-storey and the railway bridges. The police deal with more mental health problems these days, so we do too.’ (Participant 6)

‘If I see someone stumbling drunk at 6am, I’ll follow at a distance to make sure they’re ok. We’ve enough experience to tell when something is off, body language is important. My colleague saw a girl who looked upset, walking quickly, so she followed her. It turned out there was a man following her and he’d raped her.’ (Participant 7)

‘If I see an old person or a kid wandering round alone at night, I’m following them. They could be lost, missing or anything.’ (Participant 1)

Operators reported having ‘more work on’ during NTE hours. In recent years, the number of people using late night facilities has declined. *Town A* is still reeling from recession, many shops, bars and businesses have been forced to close and there is a plethora of empty, dilapidated buildings. The decline of the town centre has repelled consumerism, but also dispersed drink-related violence.

‘Friday and Saturdays used to be busy, there’s more door staff than drinkers out now. NYE last year looked like the average Saturday night 10 years ago. Everyone

is skint and a lot of bars closed. We're seeing fewer incidents each week, which is good but it doesn't mean there's less drink related crime. More people drink at home and we hear on the Airwaves how many domestics the police are going to on the weekend, it wasn't like that 10 years ago.' (Participant 3)

Operators predicted that there could be a rise in property crime in *Town A* in the non-too distant future as the town's primary industry is currently under threat due to its own financial crisis:

'The town centre is run down, they're trying to do it up with the new market and council offices, but we've got bigger problems if they don't find a buyer for the steelworks. Over half of *Town A* will lose their jobs, burglaries, shoplifting, robberies will go through the roof. Nobody is going to spend money or invest here if that happens, it'll be left to rot... at least we'll be busy.' (Participant 7)

5 Conclusion

By examining and analysing changes in a public space control centre taking place over a 23-year period, this dissertation has shown how technical, legislative and economic changes have impacted on surveillance operations and the role of the SCC. To understand the relevance, it is important to re-consider the literature and established theoretical framework. The outcomes of changes to different variables in the SCC environment have had both positive and negative effects.

The findings from this study contrast Smith's (2012) examination of control room functions and operators. Operators at the SCC receive regular, thorough training and must demonstrate relevant experience and knowledge of legal and safeguarding requirements. The data from the research itself clearly shows operators have comprehensive understanding of legislation, technology and how social processes and interactions affect their working lives.

Although the SCC's network has never experienced direct financial threats, the effects of the recession on other public services, especially the police, have seriously undermined one of the purposes of CCTV: the ability to mobilise a response. Findings about working relationships from Gould (2004), Gill et al (2005) and even earlier studies such as Honess and Charman (1992) are still relevant in contemporary control rooms. Relationships between the SCC and *CH* are often strained by stretched resources, lack of interest from the police and criticisms from either side. Interestingly, operators from the SCC seemed to view 'Shopwatch' users in similar ways that the police viewed them - incompetent. Although all parties concerned share one thing in common – the aim of reducing and preventing crime – each operates in very different ways and there is a lack of

understanding between organisations of each other's roles, priorities, and working processes. Positive working relationships emerge when services actively work with each other and take issues seriously. Operators' references to some of the work with Safer Neighbourhoods shows how local authorities are compensating for reduced police resources by dealing with more minor offenses such as ASB and begging. Future research could focus on changes to public services and how they interact with each other on a deeper level – despite working relationship tensions, one thing that is clear is that all these services could not function properly without each other.

Strained public resources also impact on what type of surveillance is conducted. Several operators referred to the police having greater involvement in social and welfare issues such as domestic violence and mental health problems in recent years. As there is a close working relationship between the SCC and *CH* the focus of surveillance has shifted from crime control to care and control. This is also reflected in the deeper functions of the SCC and *Northern Council* itself. There is an emphasis upon safeguarding and vulnerability in the core operations of contemporary public services, technologies are employed to protect the public rather than spy on them (Home Office, 2007).

It appears legislation has had minimal impact on working practices as Northern Council have maintained consistent policies and have solid frameworks in place to ensure compliance. Developments in technology have clearly transformed the capabilities of surveillance systems. While there are some issues with newer equipment, overall it seems that technology has improved operators' monitoring experiences and increased the evidential value of CCTV footage. One of the main themes that emerged was the value of time – most positive feedback referred to time saving and operational efficiency. While inconsistencies in monitoring styles are problematic in some studies (Smith, 2004; 2012),

personalised monitoring settings and shortcuts allow operators to use CCTV more efficiently. As the primary focus of the SCC is not CCTV but telecare, operators cannot continually monitor cameras, therefore new autonomous technologies are a valuable tool for capturing evidence and notifying operators of an issue, especially in high risk locations. As Keval (2009) emphasises, CCTV systems are not effective unless they have an effective design. By utilising operators' knowledge of local issues and frequent crime 'hotspots', *Engineering Company* can deploy innovative solutions which should be studied in more depth to aid further understanding of effective system use.

Findings from perspectives about automatic cameras raises questions about the relevance of Bentham's (1789) panopticon to new surveillance technologies: The automatic camera must be in a controlled environment, where panopticon surveillance should theoretically thrive (Giddens, 1985), however operators reported deliberate interaction and attempted antagonism from youths when the camera started to move. Foucault (1979) emphasised that conformity only occurs if the risk of punishment is severe enough. If operators cannot mobilise a response from the police, and the offenders are regular offenders, they will have an awareness that the police are unlikely to attend. Reeve (1998) argued that CCTV is a tool of total surveillance in a rationally ordered society, but is contemporary society rational when public resources are so limited in their capacity to remedy problems?

The findings from this study alone cannot be fully generalised to all public space control centres as their functions patently differ as demonstrated by the mixed empirical results from previous studies. It can go some way towards explaining how public space CCTV is relevant in contemporary society, and more importantly what effect underlying contemporary socio-political, economic and technological changes have had on some

aspects of surveillance. Future research should, as Smith (2012) focus on retraction, but also on differences between control rooms, whilst the closure of control centres is problematic, the continuation of surveillance is equally as important. Furthermore, it should further examine the relationships between legislation, technologies, operators and the social world and investigate how autonomous systems are transforming the face of surveillance.

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