



postnote

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CCTV

Closed Circuit Television (CCTV) surveillance of public areas, such as car parks, housing estates and town centres is increasingly commonplace. For example, 260 cameras monitor the boundaries of the Parliamentary estate. Recently, the Home Office allocated £170 million to fund public area CCTV schemes in England and Wales. This has prompted debate over whether CCTV surveillance reduces crime and whether current legislation appropriately regulates its use. This briefing describes how CCTV is used and examines issues such as its effectiveness, civil liberties and its use in court.

How CCTV systems are used

Public and private CCTV schemes can be deployed for a number of reasons:

- **Monitoring public areas** to detect incidents and to co-ordinate police responses. CCTV is also used as an aid for enforcing exclusion orders (where an offender is barred from an area) - see box opposite.
- **Recording events** for use as evidence and to inform investigations. For instance, on the boundaries of the Parliamentary estate, police on patrol alert CCTV operators of incidents via radio links. CCTV operators then record incidents as they unfold.
- **Directed surveillance** of suspected offenders.
- **Deterrence** of criminal activity – although the evidence for this is inconclusive (see page 2).

Information management

CCTV control rooms may deal with information from many cameras. 'Smart' technologies can alert operators to pre-determined people, registration numbers or incidents, reducing the need for CCTV to be constantly monitored (see automatic monitoring box on page 2). However the effectiveness of these systems depends upon the reference information (e.g. licence plate databases) being accurate and up to date.

Most CCTV systems in the UK rely on analogue recordings using standard videotape. However, digital recording is expected to dominate the industry within the next 5 years. Although concerns arise over the potential

manipulation of digital images and difficulties with viewing them in court (see page 4), digital recording has a number of advantages over analogue recorders:

- it greatly facilitates automated image searches
- it allows easy logging of operator actions ensuring correct and appropriate use of cameras
- systems are self-cleaning, removing the need to clean and replace analogue tapes manually
- digital tapes can be more easily stored and reused more often.

CCTV and Enforcement: Case Studies

Manual identification of offenders in Accrington

Accrington's 26-camera CCTV scheme is controlled from the local police station and operators are linked via radio with police and retailers. The town's small population (30,000) means that operators gain knowledge of local offenders and can identify them. Also, police provide photographs of convicted shoplifters excluded from retail outlets and CCTV operators monitor for any breaches. During the first year, there was a drop in shoplifting, criminal damage and theft from motor vehicles, with little sign of crime displacement to adjacent areas. However, it is unclear the extent to which CCTV is responsible for these effects, as other crime reduction measures were introduced concurrently.

Automatic face recognition systems in Newham

Since 1998, Newham (pop. 235,000) has piloted face recognition software. Images are compared against a police 'watch-list', which is authorised by a senior police officer, of approximately 100 convicted offenders wanted for arrest or considered likely to re-offend. CCTV operators are privy only to the personal data that is necessary for this purpose. An operator verifies matches made by the software and for false alarms the CCTV image is deleted. The system is highly publicised to deter crime; youths placed on the list are taken to view the system's capabilities. Crime in CCTV areas has dropped by an average of 35%, but motor vehicle crime in the surrounding non-CCTV areas has risen by 10%. Crimes against property have risen and crimes against people have become less common. However, again it is not possible to identify how far these effects are directly attributable to CCTV use, as other crime reduction measures (e.g. community wardens) were introduced alongside.

Automatic Monitoring

Automatic face recognition

The police can photograph anyone detained, convicted or charged with an offence. Automatic systems are available that can correlate CCTV images with digital databases of photographs. In controlled conditions these systems can achieve accuracy of 96%, but covert face recognition is likely to be less effective. Obtaining clear facial images is difficult due to factors such as lighting, movement and accessories such as hats or glasses that obscure the face. Chances of a false match increase with the size of the photograph database (this is why the Newham scheme uses a small database of images).

Automatic Number Plate Recognition (ANPR)

ANPR systems read number plates picked up by CCTV and match them against a database (e.g. the 45 million vehicles on the Police National Computer). A Home Office funded ANPR pilot in Northampton led to 364 arrests and recovery of 31 stolen vehicles and property worth £150,000 in its first 7 months. London's congestion charging scheme to be introduced in February 2003 will make use of ANPR. However, systems can have difficulty recognising number plates that do not conform to pre-determined specifications (e.g. lettering size or font) – so foreign and forged number plates may be missed or misread by the system.

Tracking and identifying suspicious behaviour

Systems can track individuals and objects (e.g. cars) from camera to camera and alert operators to events such as overcrowding and vandalism. The European Commission and partners, in consultation with potential users (e.g. London Underground) are developing such a system (see www-sop.inria.fr/orion/ADVISOR/). The system's reliability varies, as some behaviour is difficult to identify accurately.

The Home Office CCTV Initiative

In July 1998 the Home Office announced a £170 million CCTV initiative for England and Wales. It provides local partnerships¹ with the capital cost to deploy CCTV in areas with significant crime problems. Partnerships must meet maintenance and staffing costs. The initiative was heavily oversubscribed. 684 schemes have been funded ranging from £30,000 to £7 million. Bids needed to specify the crime to be targeted, estimate the impact of CCTV, and link to the police and other crime reduction programmes. Schemes had to develop a code of practice to comply with data protection and other legislation (see box opposite), and consult with the local community. After installation, schemes must evaluate their impact.

Issues

Deterrence and crime reduction

Studies into CCTV's effectiveness as a crime reduction measure report mixed outcomes. The Home Office has commissioned a systematic review of studies to date, due in June 2002. The studies shown in the box on page 3 indicate that CCTV's effect depends on the situation, location and targeted crime problem.

Differences between CCTV schemes - CCTV areas vary in size, layout, usage, and incidence of crime. Schemes can differ in ownership, management and technology. Also, additional crime reduction measures and capabilities to deploy police resources all vary considerably. This hinders generalisations about CCTV's effectiveness.

Regulating the use of CCTV

Data Protection Act 1998 – This sets out how data must be processed, including how it is obtained, held and shared. Exemption from certain provisions of the Act is available for the purposes of safeguarding national security or if compliance would prejudice crime prevention and detection purposes. In practice this applies in limited circumstances. Individuals also have a right to request copies of images that are held of them. A CCTV Code of Practice, to be reviewed later this year, provides guidance on good practice.

Human Rights Act 1998 - Article 8 states that everyone has the right to respect of private and family life. However, public authorities may interfere with this right where it is in the interests of national security, public safety, prevention of disorder or crime, or for the protection of the rights of others. Such surveillance must be fair, necessary and proportional.

Investigative Procedures - Legislation sets standards for the collection and processing of images for use in court, the sharing of personal data by authorities, good practice for showing CCTV footage to witnesses for identification, and the regulation of targeted surveillance.

The Private Security Industry Act 2001 - This will require members of the private security industry in England and Wales to be licensed. CCTV operators employed directly by Local Authorities will not require a licence, but operators supplied to them by a security contractor must be licensed.

Identifying trends – Many evaluations of CCTV assess changes in recorded crime before and after it is installed. This is unlikely to reflect crime accurately, as not all offences are reported to, or recorded by the police. Local surveys of crime may provide more accurate measures. Changes in crime may also be due to other factors, for example national trends or seasonal variations, or coincidental changes (e.g. local redevelopment).

Displacement – Although crime in the CCTV area might be prevented, crimes may be displaced to other areas or into different types of crime. Crime may be displaced to adjacent areas, but offenders can also move further afield. Displacement is not necessarily a negative effect as it can make it more difficult for offenders to operate or move crime to areas where it can be better managed. To tackle displacement rapid deployment CCTV cameras can be connected wirelessly to the control room and relocated in response to moving crime hotspots. Also, there is some suggestion that CCTV could have a 'halo' effect, leading to crime reduction in near-by CCTV-free areas, perhaps through the arrest of perpetrators.

Successful CCTV use - Integrating CCTV into an overall crime reduction strategy is likely to increase its effectiveness substantially. For example, research indicates that CCTV in car parks generally leads to a reduction in car crime². This effect appears to be enhanced with the introduction of additional crime reduction measures such as lighting, security personnel and publicity. CCTV in car parks however, was not found to lead directly to many arrests, suggesting that reduction in crime was not due to the removal of offenders. For CCTV to be effective in the long term, it may need to be seen as contributing to arrests.

Fear of Crime - It is suggested that awareness of CCTV may reduce fear of crime (see box below). However, it can be problematic to measure changes in fear of crime and to distinguish the impact of CCTV from other crime reduction measures and wider trends. Further, public awareness may influence CCTV's effectiveness. Increased perceptions of safety in CCTV areas might increase people's presence, deterring potential offenders. CCTV may also remind people to be more cautious so that they are less easily targeted by crime.

Does CCTV reduce crime? Case Studies³

Positive findings: Airdrie

In the 2 years after 12 town centre CCTV cameras were installed in November 1992, there was a 21% reduction in recorded crime. This was greater than would be expected based upon crime reduction trends in surrounding areas. Crimes involving dishonesty, including housebreaking, shoplifting and theft of and from motor vehicles fell by 48%. There was a 16% increase in the crime clear-up rate, mainly for vandalism, drugs, petty assault and breach of the peace. There was little evidence that crimes were displaced to non-CCTV areas or into different kinds of crime.

Negative findings: Glasgow

In November 1994, 32 CCTV cameras were installed in the city centre. In the next year, total recorded crime rose by 9%, although this figure included crimes not directly targeted by CCTV (e.g. fraud). The introduction of CCTV saw slight reductions in some types of offending; serious violence, breach of peace, vandalism and motoring offences. Recorded numbers of crimes of dishonesty and indecency increased and the cameras had little effect upon clear-up rates. Public awareness of CCTV was low – 15 months after installation, only 41% of people questioned were aware of the cameras. Surveys revealed that feelings of safety in the city centre did not improve following CCTV installation. Also there was no difference in awareness of CCTV between those who felt safe in the city centre and those who did not.

Mixed findings: Birmingham

14 CCTV cameras in the city centre in the early 1990s failed to reduce overall crime levels. However, recorded crime statistics indicate that CCTV reduced robbery and theft from persons, whilst incidences of theft from vehicles rose. The CCTV system was not designed to target vehicle related crime and so was not installed in many car parks. There was some displacement of crime to surrounding areas. Surveys of the public before and after CCTV installation found little change in general feelings of safety for those using the city centre during the day. Nevertheless, for those using the city centre after dark there was an increase in feelings of safety amongst those aware of the CCTV cameras. It is not clear whether these effects were a direct result of CCTV as the area was also redeveloped at the same time.

Home Office Evaluation

The Home Office has commissioned a national evaluation of CCTV's effectiveness, due to be completed in November 2004. It will evaluate 17 CCTV Initiative schemes over three years, one year prior to CCTV's instalment and two years afterwards. The Home Office evaluation will address the following questions:

- is CCTV a cost-effective measure for reducing crime?
- under what conditions does it work best?
- what is its impact upon detection, arrest, conviction, guilty pleas and police patrolling strategies?

- what is the impact on neighbouring CCTV-free areas?
- what is the deterrent effect?
- how does it impact on fear of crime?

Collecting CCTV images

The CCTV Code of Practice (see regulation box on page 2) requires public CCTV to be clearly signposted with details of the data controller(s) and the purpose of surveillance. Schemes should also be notified annually to the Information Commissioner, who encourages compliance with the Data Protection Act by raising awareness among CCTV users. The expectation is that CCTV managers will implement the Code of Practice and ensure their schemes and operators adhere to data protection legislation. Non-compliance is identified through complaints from concerned individuals. So far, schemes reported to the Information Commissioner have conformed to the Act following advice and no enforcement action has been necessary.

However, many badly run schemes may go unreported and some, such as the CCTV User Group⁴, see potential disadvantages with the present system of identifying non-compliance. The number of CCTV systems in the UK is unknown and many, particularly private schemes, may be unaware of the Data Protection Act. Also, there are no national standards for training operators in either the use of CCTV, or data protection issues, although local standards are being developed. Therefore, in addition to the general Data Protection register, the User Group has suggested a central authoritative record of all CCTV schemes in the UK. They also see merit in spot-checks of CCTV schemes to assist compliance with legislation.

Police and court use of CCTV material

There can be problems using CCTV images as evidence:

Image Quality - Cameras are often mounted on tall poles (to deter vandalism), which makes face recognition difficult. Other factors such as lighting, or the presence of trees can also affect image quality. Poor image quality has led the Metropolitan Police to launch an advertising campaign to ensure CCTV systems are well maintained.

Locating evidence from CCTV – This can be resource intensive and costly. In the case of the Brixton Nail Bomber over 4,000 hours were spent viewing 1,097 CCTV tapes. Some police forces map cameras in their area but the location of many cameras is unknown. Also, in line with the Data Protection Act, CCTV images must not be kept longer than is necessary. Many schemes use a retention period of 31 days, so police investigations are under time pressure to locate relevant material.

Technical difficulties with CCTV evidence - The range of CCTV recording formats make the collation of evidence difficult. Not all police forces possess the specialised equipment needed to play back tapes and not all digital systems can download images to VHS tapes for playback in court. The Parliamentary estate can download their digital images into any format, but has a viewing suite large enough to accommodate a jury if necessary.

Authentication of CCTV images – The potential ease with which digital images can be modified raises concerns over their reliability as evidence. A 1998 House of Lords Select Committee on Science and Technology Report *Digital Images as Evidence* concluded that it should be left to the court to decide if digital images are admissible. Authentication can be via procedural (e.g. audit trails⁵) or technical (e.g. watermarking, encryption) measures. Nevertheless, legal advisors, CCTV users and the public may not be aware of the importance of establishing the authenticity of digital images.

CCTV as an aid to person identification - Operators can be required to match police photographs of offenders to CCTV images. CCTV images can also be shown to potential witnesses for identification purposes and such evidence used in court. Research shows, however, that recognising CCTV images of unfamiliar people is very difficult, even when high quality images are used⁶. The likelihood of confusing similar looking people increases with differences in pose, lighting or facial expression, or when the face's external features (e.g. the hairline) are obscured. Despite this, people tend to be confident in their decisions, even when incorrect. When considering eyewitness identification evidence, judges may draw jurors' attention to factors influencing reliability (e.g. viewing conditions and evidence showing that confident witnesses can make errors). This research shows that similar warnings may be needed about CCTV evidence.

In contrast, people are very accurate when identifying *familiar* faces, even from poor quality CCTV footage. Research indicates this advantage is not restricted just to highly familiar faces. So, circulating to the public even poor quality CCTV images of people may lead to successful identifications. Research also suggests that circulating stills from CCTV footage in the print media is likely to be as effective as broadcasting CCTV footage. For example, the London Nail Bomber was identified when a man who worked closely with him recognised his CCTV image in a London newspaper.

Civil liberty issues

Individual Privacy

Human rights groups, such as Liberty, are concerned that new CCTV technology is rapidly applied with little consideration for the implications for privacy and civil liberties. With the increasing power of cameras people may be unaware that they are subjects of intrusive surveillance. Also, the development of automatic recognition technologies could potentially be used to monitor peoples' movements, raising privacy issues, and possibly to exclude people from public areas without reference to the criminal justice system.

Discrimination

CCTV operators must inevitably be selective with regards to what and whom they observe. Research suggests that some sub-groups (e.g. male teenagers, particularly from ethnic minorities) may be most often targeted, with crimes by other subgroups left unchecked⁷.

Disclosure of images

Under the Data Protection Act 1998 and the Crime and Disorder Act 1998, images can be disclosed to third parties for crime prevention and detection. There are no nationally agreed protocols for sharing such information, although national organisations such as the CCTV User Group have established models for the appropriate management and operation of CCTV systems.

CCTV images have been disclosed to the media. For example, Brentwood Borough Council released CCTV footage to the BBC of a man attempting to end his life. The UK courts found no breach of the law, but recommended tighter guidelines for releasing images to the media. The case is now before the European Court of Human Rights. The CCTV Code of Practice states that CCTV images of individuals should be released to the media only when the public is likely to provide information concerning a criminal incident. If disclosed for other reasons (e.g. for educational or deterrent purposes) individuals in the image should be disguised.

Overview

CCTV surveillance in public places needs to balance individual rights with the public interest. In particular:

- CCTV has received major government funding, but the conditions under which it is effective are poorly understood.
- CCTV can provide valuable information for police and courts. However, images can be of poor quality and may not be a reliable means of verifying identity.
- to avoid misuse and maintain public acceptance of CCTV, it is paramount that appropriate measures are taken to ensure compliance with data protection and privacy legislation.

Endnotes

- 1 This is managed jointly by the Home Office, the Department of Transport, Local Government and the Regions, and the National Assembly for Wales. Partnerships can include local authorities, police and businesses.
- 2 Tilley (1993). Understanding Car Parks: Crime and CCTV: Evaluation Lessons from Safer Cities. Paper 42. Police Research Group. Crime Prevention Unit Series
- 3 For sources see www.scotland.gov.uk/cru/resfinds/crf08-00.htm, www.scotcrim.u-net.com/researchc2.htm and www.homeoffice.gov.uk/prgpubs/fcdps68.pdf
- 4 A national organisation that represents the interests of CCTV users. Members include Local Authorities, police, universities, commercial users and those involved in the provision of CCTV services.
- 5 Aldridge (2002). Digital Imaging Procedure. www.homeoffice.gov.uk/pcrg/psdb/publications/digimpro.pdf
- 6 Henderson, Bruce, & Burton (2001). Matching the Faces of Robbers Captured on Video. *Applied Cognitive Psychology*, 15, 445-464.
- 7 Norris, & Armstrong (1999). *The Maximum Surveillance Society: The Rise of CCTV*, Oxford: Berg

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