

The Effectiveness of Public Space CCTV:

**A review of recent published evidence
regarding the impact of CCTV on crime**

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Summary of key points from the literature review:

- **Very little evaluative research into the effectiveness of CCTV has been conducted since the year 2000.**
- **There is minimal evidence to suggest that CCTV effectively deters crime, and in cases where crime does appear to be deterred, this effect is generally short-lived.**
- **Key researchers have recently suggested that media coverage of CCTV installation may impact the extent to which CCTV will have any deterrent effect on crime.**
- **Recent research has resulted in evidence consistent with the repeated finding that CCTV may be more effective in deterring crime in smaller and less complex areas than large city centres.**
- **The opinions of convicted offenders largely suggest that cameras are not perceived as a threat, particularly in situations fuelled with alcohol.**
- **The reality of crime displacement remains inconclusive.**
- **There is some evidence of a diffusion of benefits in terms of crime reduction to surrounding areas following CCTV installation but, like deterrence, these effects appear to diminish with time.**
- **There is some evidence to suggest that crime displacement may occur on a small scale, within the local (CCTV targeted) area itself.**
- **Evidence from intervention studies incorporating an additional outcome measure to recorded crime statistics suggests that CCTV may be more effective in terms of increased crime detection than it is in terms of deterrence, particularly in the case of violent crime.**
- **Full realisation of the potential benefits of increased crime detection depends on a wide range of factors beyond the quality of the CCTV system itself.**
- **The police largely view CCTV as a useful time saving tool that supports their work in a variety of ways.**
- **Estimations of potential economic savings generated by CCTV are considerably high however, such estimations have not yet been balanced out against the cost of installing CCTV, preventing a true picture of its economic benefits.**
- **The findings of psychological experiments suggest that evidence captured on CCTV may lead to the most successful and reliable outcome, in terms of securing a conviction, when circulated in the media, through provoking identification by members of the public familiar with the offender.**
- **The extent to which CCTV improves public feelings of safety remains unclear due to conflicting results of prior- and post-intervention surveys.**
- **Anecdotal evidence suggests there are many additional benefits of CCTV that go beyond any impact it may have on crime.**

<u>Contents</u>	<u>Page</u>
Introduction and aims	4
Method:	6
Criteria for inclusion of evaluation studies	6
Search strategies	6
Results:	9
1. Crime deterrence effects	9
Summary of evidence	9
Evidence from quasi-experimental intervention studies	10
Further evidence	11
2. Displacement of crime	13
Summary	13
Evidence from quasi-experimental intervention studies	13
Further evidence	14
3. Detection of crime	15
Summary of evidence	15
Evidence from quasi-experimental intervention studies	15
Further evidence	16
4. The use of evidence in the investigation and prosecution process	18
Summary of evidence	18
Evidence from interview and questionnaire data	18
Evidence from psychological experiments	19
Benefits beyond the impact on crime:	21
Feelings of safety and public confidence in CCTV	21
Further benefits	22
Conclusions:	23
How effective is CCTV?	23
Crime deterrence	23
Crime displacement	24
Crime detection	24
The use of evidence in the investigation and prosecution process	25
Further benefits of CCTV	25
Priorities for future research	26
References	27

Introduction and Aims

In recent years there has been a tremendous growth in the use of close-circuit television (CCTV) to prevent crime in public space, especially in Britain (Norris & Armstrong, 1999), and to a much lesser extent, in the United States (Nieto, 1997). In Britain CCTV is considered to be the single most heavily funded crime prevention measure (Welsh & Farrington, 2004a). In terms of reducing crime, there are two main ways in which CCTV, in theory, is claimed to work. The first is that, it will deter criminal activity as potential offenders perceive an elevated risk of apprehension (Armitage, Smyth, & Pease, 1999). The second is that, through the early detection of crime, police can be deployed to the scene thereby, preventing minor incidents from escalating into more serious incidents, and in response to suspicious behaviour, prevent crime altogether (Armitage et al, 1999). Of course CCTV, along with any other crime prevention intervention, cannot escape the negative potential consequence of displacement, which refers to the shift of crime either in terms of space, time, or type of offending from the original targets of the intervention (Repetto, 1976). Beyond any initial crime prevention effect however, the positive contribution of 'evidence' recorded in CCTV footage to the investigation and prosecution process is also, commonly put forward in support of the use of CCTV.

Many criticisms have been made that claims of the effectiveness of CCTV, and its subsequent spread across the country, have not been based on valid and reliable evidence. Researchers have therefore, recently focussed on reviewing the existing literature, in attempt to form some firm conclusions regarding the impact of CCTV on crime. The following is a summary of these conclusions:

- CCTV is generally most effective in deterring acts of property and vehicle crime, and has virtually no impact on deterring violent crimes (Deisman, 2003; Welsh & Farrington, 2002; Welsh & Farrington, 2004a).
- CCTV is more effective in terms of crime deterrence in Britain, than North America (Welsh & Farrington, 2002; Welsh & Farrington, 2004a; Welsh & Farrington, 2004b).
- The potential of CCTV to deter crime largely depends on the suitability of the area in which it is installed (Armitage, 2002) where, generally speaking, more positive deterrence effects are seen in smaller and less complex environments (Deisman, 2004).
- Unless publicity and media coverage of CCTV cameras is maintained, then any initial deterrence effect tends to fade with time (Armitage, 2002).
- Evidence regarding potential crime displacement effects are too contradictory to allow for any firm conclusions to be drawn (for summaries of the evidence see Armitage, 2002; Deisman, 2003).

Welsh and Farrington (2002) compiled, what is largely considered, the most systematic review of the previous literature to date. These authors maintain that, while it is necessary to research the effectiveness of CCTV as a crime prevention measure, the quality of the methodology used to do so is just as important. Therefore, in their systematic review, Welsh and Farrington (2002) only include evaluations that meet the following quality criteria:

- CCTV is the main focus of the intervention
- There is an outcome measure of crime
- There is a 'before' and 'after' measure of crime
- There is at least one comparable control area for each target area
- The total number of crimes in each target area must have been at least 20 before the intervention was installed

Of all the literature reviewing CCTV, Welsh and Farrington (2002) only found 22 studies to include in their review which met these criteria, and the majority of these studies were conducted in the 1990's. Since then, many technological advances have been made, which may have an impact on the effectiveness of CCTV in terms of crime prevention and reduction. It is therefore, important to review the results of more recent literature which may account for the effect of any improved advancements. The present review of the literature will only include studies that have been conducted since the year 2000. It is recognised that a great deal of insight can be gained by looking beyond quasi-experimental studies - the traditional means of evaluating the impact of CCTV on crime, and the only focus of previous systematic reviews. Other forms of recent research evidence will therefore, be drawn on to evaluate the effectiveness of CCTV. This includes interview and focus-group data (quantitative and qualitative), observation data, and findings from psychological laboratory experiments.

Where previous reviews of its kind have addressed the general impact of CCTV on crime, this report will review the evidence of the effectiveness of CCTV in terms of the effect on crime, relating to the following four specific objectives:

- 1. Crime deterrence effects**
- 2. Crime displacement effects**
- 3. Detection of crime**
- 4. The use of evidence in the investigation and prosecution process**

Method

Criteria for inclusion of evaluation studies

While the importance of drawing conclusions based only on methodologically robust research is recognised, given that very few studies into the effectiveness of CCTV have been conducted during the past seven years, it was simply not practical to adopt the inclusion criteria set out by Welsh and Farrington (2002) in this review. The following inclusion criteria were therefore, adhered to:

- The study must be empirical where data is collected by the researchers, be it qualitative or quantitative, and through a variety of research methods, be it interview techniques, or traditional quantitative experimental technique.
- CCTV had to be the only, if not, the main intervention included in the evaluation, and only in the context of public space cameras.
- There was an outcome measure of crime (applicable to intervention studies only).

Importantly, although the above inclusion criteria may not appear thorough, all conclusions were drawn with caution, and in the case of quasi-experimental intervention studies, in light of the strength of the methodology used.

Search Strategies

The following search strategies were carried out to identify relevant research studies:

- Searches of on-line databases
- Searches of bibliographies of CCTV reports
- Contacting leading researchers directly
- Contacting representatives from local authorities

The following on-line databases were searched:

- Criminal Justice Abstracts
- National Criminal Justice Reference Service (NCJRS) Abstracts
- ASSIA
- Web of Science
- Ingenta
- Idox
- Emerald
- Swetswise
- PsychInfo

The following terms were used to search the above databases: closed circuit television, CCTV, CCTV + effective*, CCTV + crime, CCTV + crime + reduction, CCTV + crime + displacement, CCTV + public space.

These search strategies resulted in five quasi-experimental crime intervention studies, four interview studies (collecting quantitative and qualitative data), two studies incorporating psychological experimental methods and theory, and one observation study of behavioural adaptations to CCTV.

The following table provides a summary of the key aspects of the methodologies involved in the five quasi-experimental intervention studies reviewed. It is helpful to outline these methods here in attempt to avoid repetition, as these studies may be discussed repeatedly, with regards to more than one of the review's objectives. Furthermore, by summarising aspects of the methodologies used, limitations may quickly become apparent against the backdrop of Welsh and Farrington's (2002) quality criteria, which may in turn have implications for the extent to which conclusions can be drawn.

Table 1 – Summary of methodologies adopted in quasi-experimental studies

Author and date	Aim	Target area	Control area	Other interventions evaluated by study	Crime outcome measure	Duration of observation before & after CCTV	Total no. of recorded crimes before CCTV
Farrington, Bennett & Welsh (2005)	To assess the effects of CCTV on crime, disorder and fear	Cambridge city centre	The Grafton shopping centre	None	Police-recorded crime statistics, & victimisation survey data	11 months before & after for crime stats, & 1 week before & after for survey data	2, 600 in target area, & 1, 324 in control area
Gill & Spriggs (2005)	To assess the effects of CCTV on crime	14 English public space targets inc. city centres, hospitals, & public car parks	14 control areas similar in ethnicity, unemployment rates, and academic qualifications, & buffer areas within 1 mile radius of the target areas	None	Police-recorded crime statistics, & fear of crime survey data	12 months before and after for one target area, & 6 months before and after for the remaining 13	Varied across the 14 target areas, but above the minimum 20 as specified by Welsh & Farrington (2002)
Goodwin (2002)	To evaluate CCTV project in terms of outcome and implementation	Devonport public space CCTV system incorporating 8 cameras across 6 sites	None	None	Police-recorded crime statistics, & calls-for service data (available for 2 of the 6 sites)	2 years before, & 2 years after	205 across all 6 sites (max 67, min 19)
Griffiths (2003)	To review the long term effects of CCTV on crime	Gillingham	Strood, a match to Gillingham across a range of demographics inc. crime rate, population, employee jobs	None	Police-recorded crime statistics	12 months before, & 5 years after	1, 376 in target area, & 1, 298 in control area
Sivarajasingham, Shepherd & Matthews (2007)	To evaluate the effect of CCTV on levels of assault injury and violence detection	5 English towns/cities	5 control towns/cities within the same geographical area, matched for population	None	Assault related emergency attendances, & police recorded violent offences	2 years before, & 2 years after	1, 629 across all 5 target areas (max 485, min 213). 1, 770 across all 5 control areas (max 867, min 83)

Appropriate detail regarding the methods adopted in the other forms of research included in this review will be discussed in the results section, in the context of the implications these may have for the conclusions that can be drawn.

Results

In this section, evidence relating to each of the four objectives will be presented and discussed in light of any methodological concerns. Firstly, the recent evidence regarding each objective will be summarised. Evidence from quasi-experimental intervention studies will then be discussed in more detail, before further evidence from other forms of research is discussed.

1. Crime deterrence effects

Summary of evidence

- Findings from a longitudinal study by Griffiths (2002) suggest that CCTV may effectively deter crime initially within the first year following installation but, that this positive effect is not maintained thereafter.
- Evidence from Griffiths (2002) suggests CCTV is most effective in deterring shoplifting and vehicle theft, the latter being consistent with previous research.
- There is little evidence from the multi-evaluation carried out by Gill and Spriggs (2005) to suggest that CCTV effectively deters crime: a significant decrease in recorded crime was not observed for any of the city centres included in this study and, the only significant reduction in crime across the entire evaluation that could be attributed to the installation of CCTV occurred for ‘Hawkeye’ car park.
- Goodwin (2005) did not find any evidence of crime deterrence however, methodological problems identified with this study threaten the reliability and validity of these results.
- From their focus group discussions with convicted murderers, Gill et al (2006) found that cameras were not generally perceived as being particularly threatening, and appear to have an even lesser effect in situations fuelled with alcohol.
- Mazzerolle, Hurley and Chamlin (2002) found some evidence to suggest a deterrence effect of CCTV on anti-social behaviour, where observed instances of such gradually declined in two of the areas covered in the study and, initially declined for the first month following CCTV installation in the third and final area observed..
- The suggestion that the degree of media coverage surrounding a CCTV project may mediate its effectiveness in terms of sustained crime deterrence effects has been made by more than one researcher in attempt to explain the finding that initial deterrence effects often fade with time.

Evidence from quasi-experimental intervention studies

The findings of Griffiths (2002) suggest that the installation of the Gillingham CCTV project may have deterred crime. Police statistics across all types of crime experienced an initial dramatic decrease for both the target area, Gillingham (44% crime reduction), and the control area, Strood (22% crime reduction), during the first year following the installation of CCTV. These figures then rose again in both areas during the course of the next 2 years after that, before declining again once more in Strood, and rising slightly further in Gillingham. When these figures were broken down into specific crime types, it became apparent that CCTV had the biggest impact on shoplifting (-49%), and vehicle theft (-37%) in Gillingham, and that the only two average increases in Gillingham were for drugs (+550%) and violence (+32%). It is important to note however, that the figure for drug crime was so small prior to the installation of CCTV (only two recorded instances) that it did not allow for any informative comparison between the prior- and post-CCTV period to be made. Caution should therefore, be taken when drawing conclusions from this '+550%' figure. The failure of this CCTV project to deter violent crime is indeed consistent with previous findings and therefore, unsurprising. It is possible that the 32% increase in recorded violent crime observed in this study is attributable to an increased level of detection however, the potential to confirm this suggestion goes beyond the scope of this study as recorded crime statistics were the only outcome measure of crime included.

The changing nature of crime statistics across the four year follow up incorporated in this study highlights the great insight gained through a longitudinal design when investigating the effects of CCTV on crime. However, the fact that data was only available for 12 months prior to CCTV installation, compared to five years after CCTV installation, is somewhat of a methodological limitation as it could equally be argued that this was not a long enough period to form a clear picture of the situation as it once was before CCTV was introduced to the area. Nevertheless, the pattern of an initial dramatic decrease, followed by a general upward trend in crime statistics is interesting, and calls for consideration. Griffiths (2002) points to a potential role of the media in determining the extent of deterrence effects. It is reasonable to suggest that a frenzy of media interest in the installation of CCTV in Gillingham, may have contributed to the initial deterrence effect observed, and that as this coverage declined, so did this deterrent effect. The role of the media and publicity in crime deterrence following CCTV installation is therefore, a topic worthy of further investigation.

Gill and Spriggs (2005) conducted what is generally considered to be the largest, most comprehensive evaluation of CCTV to date. The results of this study are more complex to interpret with regards to deterrence effects given that this study consisted of a multi-evaluation of 14 English towns and cities. The installation of CCTV was followed by a reduced number of crimes in only two of the fourteen projects evaluated ('City Outskirts' and 'Hawkeye'). This was true whether the crime rate of this target area was compared with the buffer area or the control area. Even then, as the decrease in crime for 'City Outskirts' also exactly coincided with improvements in lighting, the apparent deterrence effect for this area could not be attributed solely to the introduction of CCTV, although this does suggest that CCTV may have the most positive deterrence impact when combined with improved street lighting. Nevertheless, out of the fourteen projects evaluated in this study, in only one of these is it plausible that CCTV was a significant factor in the following reduction in crime.

Police-recorded crime rates actually increased after the installation of CCTV in several target areas. Interpreting these findings in light of potential deterrence effects is difficult as it cannot be automatically assumed that CCTV failed to effectively deter crime, where this increase in recorded crime statistics could alternatively reflect an increase in the detection of crime. Indeed Gill and Spriggs (2005) acknowledge that crime rates are a poor measure of the effectiveness of CCTV for this very reason. Nevertheless, observation of the crime rates in each control area relative to the target area does allow for some insight into this 'deterrence versus detection' issue. For example, for projects where recorded crime rates significantly increased for both the target and control areas, then such changes cannot be attributed to increased crime detection through the installation of CCTV, and thus, CCTV can be concluded as having failed to effectively deter criminal activity.

Interestingly, none of the city centre CCTV projects evaluated in this study appeared to have had any deterrent effect on crime. This thereby, raises the issue that aspects of the area in which CCTV is installed may have an impact on its ability to have any positive impact on crime. Indeed the conclusion that CCTV failed to have a deterrent effect on crime in large city centres is certainly consistent with the repeated finding documented in previous reviews of the literature that CCTV generally has a more positive impact in terms of crime deterrence on smaller, and less complex areas.

The most significant and desirable effect of CCTV in this study was found for 'Hawkeye' train station car park where crimes decreased by 73% (from 794 to 214). Again, this finding is consistent with the conclusion that CCTV is most effective in deterring vehicle crimes, and that more generally, CCTV has differential effects on different types of crime. It could be argued that many vehicle crimes involve forward planning, and that this level of involved rationality makes this type of crime more likely to be effectively deterred by the presence of CCTV cameras. Furthermore, a car park area is smaller than city centre areas, and arguably, less complex.

Similarly to that of Gill and Spriggs (2005), a first glance at the findings of Goodwin (2002) would initially lead to the conclusion that CCTV failed to have any deterrent effect on crime given that, across the six camera locations covered in the study, the number of crimes recorded by the police before the installation of CCTV was 205, and the number of crimes recorded by the police after the installation of CCTV was 213. Furthermore, the calls for service data, which was only available for two out of the six evaluated sites, remained consistent across the prior- and post-CCTV periods, again suggesting no deterrent effect of CCTV. However, this gross level of analysis is not very informative considering it tells us nothing about the effect of CCTV on specific types of criminal activity, or indeed differences in the effectiveness of CCTV across the six different locations covered in the project. Limitations with the methodology of this study however, prevent conclusions being drawn with regards to these issues, even after the appropriate analysis is conducted. The main problem is that when the police-recorded crime statistics, and calls for service data are broken down in terms of specific crime types, and individual locations, the numbers become too small for meaningful comparisons over time to be made. Furthermore, this study incorporates no control comparison, and would thus not have met the minimum quality inclusion criteria advised by Welsh and Farrington (2002). It would therefore, not have been possible to attribute any decreases in crime statistics to the installation of CCTV, as the potential effect of other factors was not controlled for. Given however, that no such significant decreases were documented in this study, this was not a great deal of an issue.

Further evidence

Gill, Spriggs, Little and Collins (2006) attempted to explore the potential of CCTV to deter crime through conducting focus group discussions with ten murderers. All the offenders were about five years into their sentence, and seven of the ten had committed their murder in a public place. It has already been outlined that CCTV appears least effective in deterring violent crime however, it is not clear as to whether this extends to very serious offences. The aim of this study was therefore, to investigate whether the murderers involved in the focus groups would have been deterred by the presence of CCTV cameras at the time of committing their offence.

Generally speaking, it was clear that the respondents did not perceive cameras as particularly threatening. One offender reported an incident in which he was caught on camera and subsequently arrested for shop theft, but where the CCTV evidence was not clear enough to allow for a conviction. This finding represents an opportunity for increasing the potential of deterrence effects through improving the quality of CCTV evidence, and increasing instances of subsequent conviction. With regards to the murders committed, most of the participants were of the view that even if cameras had been there, it would not have made much difference. One said "*...coming out of clubs when you're all tanked up and that you don't even recognise the cameras are there. I mean when I got arrested for my offence I didn't even know there was a camera there*" (p14). This raises two issues: firstly, that when alcohol is involved and all sense of judgement is impaired, the potential deterrent impact of CCTV is automatically diminished; and secondly, that public space cameras, such as those outside

nightclubs, may largely go unnoticed either due to the effects of alcohol, or perhaps through a lack of advertisement and public awareness.

Despite these largely negative findings, one positive suggestion to have emerged from this study was that CCTV may act as a deterrent to an individual who has already been caught out by CCTV and suffered the consequences: “*If you learn by your mistakes it’s a deterrent you know what I mean? If you’re not prepared to learn then it’s no deterrent*” (p15). This response introduces another interesting factor which may determine the extent to which CCTV deters criminal activity – the individual, and their own personal beliefs and previous experience of CCTV within the criminal justice system.

Mazerolle, Hurley & Chamlin (2002) adopted an altogether different approach to investigating the impact of CCTV on behaviour in their study. These authors observed CCTV footage to assess people’s behaviour, both pro-social and anti-social, in response to the introduction of CCTV to three areas in Cincinnati. Where the focus of studies previously discussed has been on the deterrence of crime, it is important to note that the main objective of many CCTV projects is to deter *anti-social behaviour*, an increasing concern in today’s society. The observations were conducted for 2-3 months, starting on the day CCTV was installed. A sampling procedure was devised by the researchers to guide the selection of video tape snippets for observation. Activities occurring throughout the course of these snippets were then coded as being ‘pro-social’ (e.g. riding a bike, walking a pet, greeting others); or ‘anti-social’ (e.g. loitering, drinking alcohol). Calls for service data were also analysed.

The time series analysis of CCTV footage data for two of the target sites (‘Hopkins Park’ and ‘Northside’) revealed a gradual decline in anti-social behaviour over time, which arguably could reflect a sustained deterrence effect of CCTV. The number of calls for service made to the police also decreased in these areas. In the third site however, ‘Findlay Market’, the analysis of CCTV footage data and calls for service data suggested that there may have been an initial anti-social behaviour deterrent effect during the first month, but that this was then accompanied by a gradual increase in anti-social behaviour during the two months to follow. The authors suggested that the initial deterrence effect observed within the first month could be associated with the high level of media interest and publicity that surrounded the installation of the CCTV project, and that as interest in the cameras diminished with time, so did the anti-social behaviour deterrence effect of CCTV. This is a suggestion that has been made previously in attempt to explain initial, short-lived deterrence effects.

2. Crime displacement effects

Summary of evidence

- **Gill and Spriggs (2005) found no evidence of significant spatial displacement or a diffusion of benefits from the target area to the surrounding area for any one of the CCTV projects evaluated in their study however, there was evidence of spatial crime displacement, on a much smaller scale, within the target area itself.**
- **Griffiths (2003) observed an initial diffusion of benefits in terms of a reduction in recorded crime for the control area ‘Strood’ throughout the immediate year following the installation of CCTV in ‘Gillingham’ however, crime rates consistently rose again during the next four years thereafter.**
- **Goodwin (2002) found no evidence of crime displacement however, concerns over the methodology of this study threaten the reliability and validity of these results.**
- **Gill, Spriggs, Little and Collins (2006), in their focus group discussions with convicted murderers, found that displacement to another type of crime following the installation of CCTV may be a potential consequence of CCTV although, this is an issue which has been paid very little attention to date.**

Evidence from quasi-experimental intervention studies

Gill & Spriggs (2005) reasoned that had crimes been displaced from the target area to the buffer area, then crimes should decrease in the target area and increase in the buffer area, relative to the control area. Only one of the fourteen projects (‘Northern Estate’) evaluated in the study met these requirements for evidence of crime displacement and even then, the decrease in the target area was small and not significantly different from the change in crime rate in the control area. Therefore, the evidence in this study to suggest CCTV had caused spatial displacement of crime was very minimal. If there was a diffusion of benefits from the target area to the buffer area, then crime should have decreased in both of these areas relative to the control area. There was no evidence of this scenario in any of the target areas and their controls. Therefore, no evidence of a diffusion of benefits following the installation of CCTV was found in this study. One interesting finding regarding displacement to have emerged however, was that for one of the project areas, ‘Eastcap Estate’, the greater part of the decline in crime statistics occurred within close vicinity of the cameras (100 metres), within the target area itself. This indicates that displacement can occur on a smaller scale than what is usually considered plausible.

The potential to evaluate instances of displacement in the study by Griffiths (2003) was limited due to focus being concentrated on one control area only. The author acknowledged himself, that had the potential to review the crime statistics of every neighbouring town following the introduction of CCTV to Gillingham been fulfilled, then a more valid conclusion regarding displacement effects may have been drawn. For the control area, ‘Strood’, a temporary diffusion of benefits appears to have occurred. Although the overall reduction in crime for Strood between 1996 and 2001 was only 0.05% (compared to 35% in Gillingham), there appears to have been an initial diffusion of benefits in 1997, where the total crime rate fell by 22%, before rising again by 19% at the end of 1998. This dramatic reduction in the initial 12 months of CCTV installation in Gillingham is again, attributed by the authors, to the high publicity surrounding the introduction of the scheme. According to this theory,

once the 'dust had settled' publicity-wise, and offenders had worked out which exact areas the cameras covered, crime rates began to increase again.

Some of the stakeholders interviewed by Goodwin (2002) suggested that crime may have been displaced to other areas not monitored by the cameras of the Devonport CCTV scheme. To investigate this issue, the author examined police-recorded crime statistics for three streets within close proximity to the target areas. The data relating to two of these streets ('Bluff Road' and 'Victoria Parade') did not reveal any evidence of displacement, where the total number of crimes reported to the police after CCTV was installed in the target area was slightly less than the number reported before the installation of CCTV in the target area. The total number of crimes reported in the third street however, 'Formby Road', had increased from 47 in the pre-CCTV period to 78 in the post-CCTV period. When broken down into the individual types of crime, it became clear that this overall increase in crime rates for the area was attributable to increases in 'burglary', 'property crimes', and 'vehicle thefts', but not 'assault/robbery', instances of which had decreased after the installation of CCTV in the target area.

These findings could be interpreted as evidence of displacement effects following the introduction of the Devonport CCTV scheme. However, there are major concerns over the methodology and analysis conducted by the author, which should be acknowledged. First of all, there is the previously acknowledged limitation that this study incorporates no control comparison, meaning the potential impact of some other crime intervention in the target area cannot be ruled out. Secondly, no justification was given by the author for including only these three streets in the displacement analysis. The study may therefore, have overlooked significant displacement effects elsewhere. Thirdly, no statistical analysis was carried out to determine the level of significance of the increases in crime data over time. And lastly, as was the case with the crime statistics collected for the target areas, when these figures were broken down by specific types of crime, the figures were just too small to allow for any meaningful comparisons over time to be made. For example, the pre-CCTV figure for 'assault/robbery' incidents is as low as 4 for 'Formby Road', which is drastically below the minimum acceptable figure of '20' outlined by Welsh and Farrington (2002) in their recommended quality inclusion criteria. Given the limited amount of research into this issue conducted since the year 2000, these findings will remain of some interest however, due to the methodological concerns discussed, the extent to which conclusions can be drawn, with regards to the potential crime displacement effects of CCTV, is greatly limited.

Further evidence

Although the main aim of Gill et al (2006) was to investigate the issue of CCTV deterrence effects through conducting focus groups with murderers, the issue of displacement was raised. The complexities and difficulties involved in researching this issue through quasi-experimental techniques have become apparent through the methodological criticisms that have been made of such recent studies. Although it may not be a particularly robust, or advanced research method, simply listening to what offenders have to say does provide an insightful and straightforward means of directly tapping into the issue of crime displacement. The findings to emerge from these focus groups suggest the evidence for displacement is only partial. However, some evidence that displacement may, under some circumstances, be a consequence of CCTV did emerge. One participant for example, said: *"I'd rather go for easy pickings...I'd rather go to a place where there isn't cameras"* (p13). This is evidence that spatial displacement may occur. Another said: *"Once you've been caught first that hunting ground is no longer available. If you keep getting caught for the same crime then you're going to change crime aren't you? You change tactics if you like"* (p13). This is evidence that as opposed to just spatial displacement, a shift to a different type of offending may also occur. Coverage of this latter form of displacement is largely underrepresented in the literature.

3. Detection of crime

Summary of evidence

- **Through their comparison of both police recorded crime statistics and victimisation survey data, Farrington, Bennett and Welsh (2007) found evidence to suggest that CCTV had failed to deter crime in Cambridge, but had effectively led to increased crime detection rates.**
- **Through their comparison of both assault related emergency attendances and police recorded violent crime statistics, Sivarajasingham, Shepherd and Matthews (2003) found evidence to suggest that CCTV failed to deter violent crime, a conclusion drawn by many previous researchers, but had led to the increased detection of violent crime which in turn, contributed to a decrease in the severity of violent crime outcomes in terms of injury.**
- **Through focus group discussions and interviews with the police and other beneficiaries, Levesley and Martin (2005); and Owen, Keats and Gill (2006) unveiled a wide range of benefits of CCTV related to the subsequent increased detection of crime including: a reduction in time spent on investigation; the prevention of minor incidents from escalating into more serious incidents; the prevention of certain incidents in some cases from ever occurring e.g. drink-driving related incidents; and related economic savings.**
- **A small group of police respondents interviewed by Levesley and Martin (2005) also highlighted the negative effect of deployment to non-priority incidents through increased detection.**

Evidence from quasi-experimental intervention studies

Farrington, Bennett, & Welsh (2007) found that the percentage of respondents in their survey reporting to having been victimised before the installation of CCTV (26.4% in the target area; 11.4% in the control area), did not significantly change after the installation of CCTV (28.5% in the target area; 13.6% in the control area). Police-recorded crime statistics however, decreased by 15% in the control area compared to the target area, following the introduction of CCTV to the target area. These results therefore suggest that where the Cambridge CCTV project may have failed to deter crime (evident from the consistent victimisation survey data prior- and post-CCTV installation), it did succeed in increasing the detection of criminal activity (evident from the increased police crime statistics in the target area, compared to the control area). This conclusion highlights the importance of supplementing police crime statistics with other data, in order to accurately distinguish between two conflicting and equally plausible causes of change in crime statistics following the introduction of CCTV – deterrence effects, and increased crime detection. Importantly, the methodology in this study was robust whereby, the minimum criteria outlined by Welsh and Farrington (2002) were conformed to, and where steps were taken to minimise potential bias when conducting the victimisation surveys. This conclusion can therefore, be drawn in confidence.

Another methodologically robust CCTV evaluation by Sivarajasingham, Shepherd and Matthews (2003) was also extremely informative with regards to distinguishing between real changes in crime rates, and increases in crime detection and recording. Instead of victimisation survey data, these authors compared police recorded violent crime statistics with assault related emergency department attendances in attempt to shed more light on the effects of CCTV on violent crime in particular. Indeed this is an interesting issue, as research has repeatedly found CCTV to have no deterrent effect

on violent crime. The findings of this study however, suggest that CCTV could have a desirable effect on violent crime in terms of increased detection.

During the two years following the installation of CCTV, compared to the two years prior to the installation of CCTV, assault related emergency department attendances decreased across the five target areas included in the study by 3%, and increased across the five matched control centres by 11%. Police recorded violent crime statistics increased during the two years following the introduction of CCTV by 11%, and increased in control areas by 5%. It is important to note that a significant decrease in assault related emergency department attendances, and a significant increase in police violent crime statistics, was not uniform for each of the five target sites included in the study: three out of the five target areas experienced a significant decrease in assault related emergency attendances, and four out of the five control areas experienced a significant increase in assault related emergency attendances. Three out of the five target areas experienced an increase in police recorded violent crime statistics, where two of these increases were statistically significant. Nevertheless, the total figures do depict the overall trend. The conclusion drawn was that CCTV led to an increased detection of violence (reflected in the increase in police recorded statistics), which in turn allowed for a rapid response, preventing many instances of violence from escalating into injuries needing medical attention (reflected in the decrease in the number of assault related emergency department attendances for the target areas).

Clearly, this study found no evidence of a deterrent effect of CCTV on violent crimes as if such an effect had occurred, a decrease in police recorded violent crime statistics would have been observed. And so, although CCTV in this case did not deter offenders from committing violent crimes (a finding consistent with the literature and indeed, unsurprising given the often impulsive nature of violent crimes), it did limit the level of injuries sustained through increased detection and rapid police response to developing situations. The potential value of CCTV detection of violent crime is therefore, illustrated well by this study. The true extent of this value however, is clearly highly dependent on a number of other factors such as for example, the availability of police time and resources; the efficiency of CCTV operators; and the level of communication between these two services.

Further evidence

Owen, Keats and Gill (2006) aimed to identify the different types of benefits the police can gain from CCTV, and where possible, to put a financial figure on these benefits. These authors reviewed police files; reviewed police activity analyses originally prepared for the Home Office; conducted focus groups with police officers; and interviewed representatives from a wide range of organisations involved in CCTV including the Police Quality File Department, the Crown Prosecution Service, the Scenes of Crime Team, the Finger Printing Bureau, Magistrates Court, the Probation Service, and the Civil Claims Department. A wide range of police benefits were highlighted as a result of this project, and many of these related to the potential of increased crime detection through the use of CCTV.

The following is a summary of the benefits that were reported throughout the course of this study, in terms of the impact of CCTV on the detection of crime. CCTV technicians can detect and report offences thereby, reducing the investigation time that would have been required if the incident had not been observed. Monitoring CCTV footage in real time allows for the early detection of incidents, and providing this is followed by a quick response, can prevent minor incidents from escalating into more serious incidents. CCTV teams can alert the police to drink drivers when suspects are seen to drive home after leaving drinking establishments. This can prevent potential road traffic accidents and their related costs to the police, courts and National Health Service. Finally, it was documented that CCTV operators can detect weapon possession, which of course, carries obvious benefits in terms of potential future incident prevention. Although there are no statistics illustrating the magnitude of these benefits, importantly, they reflect the views, and indeed, experiences of individuals working with, and alongside, CCTV. It quickly becomes apparent that the main benefit of increased crime detection is that it potentially allows for intervention before an incident can escalate into something

more serious, and in some cases, the prevention of criminal incidents altogether. However, once again, the extent to which this potential can be fully realised, does depend on a number of factors beyond the quality of the CCTV system itself. The availability of resources, the police in particular, is clearly the biggest threat to the realisation of the benefits discussed here.

Given that these benefits are related to preventing incidents from escalating, or indeed preventing incidents from occurring in the first place, it is very difficult to put a figure on them in terms of economic savings. Owen et al (2006) however, estimated potential savings of up to £1,601,600 a month as a result of early intervention. The economic benefits of CCTV is an issue worthy of further investigation, and will be discussed again in the following section of this report.

Levesley and Martin (2005) also conducted exploratory research in the form of self-completion questionnaires and structured interviews with more than 250 officers, across 33 forces. The aims of this project included establishing in what context and for what purposes CCTV was used by the police, and to investigate officers' views on effectiveness. The majority of officers who participated in the study (78%) rated CCTV as a useful tool in deploying police and other resources. However, a small number of officers (7%) did raise the negative effect of deployment to non-priority incidents. The strength of CCTV was said to lie in its ability to pro-actively detect incidents. Given the large majority of participants emphasised the value of detection and consequent deployment, this is unsurprising. It does however, raise the question of what use cameras that are not pro-actively monitored in real time can have to the police. It would appear the answer lies in the usefulness of the recorded evidence to the prosecution process, an issue that will now be considered.

4. The use of evidence in the investigation and prosecution process

Summary of evidence

- **Owen, Keats and Gill (2006); and Levesley and Martin (2005) found that there are many uses of evidence from CCTV footage and that the biggest contribution this makes to the police is the time it frees up for other tasks, which in turn, has economic benefits.**
- **Many officers interviewed by Levesley and Martin (2005) expressed amazement and dismay at the difficulty the courts still have with showing images caught by CCTV, which prevents evidence from being used to its full potential.**
- **Through their series of laboratory experiments, Davies and Thasen (2000) found that identification of unfamiliar people from CCTV footage is a highly fallible process, and concluded that the practice of inviting unfamiliar individuals to compare the appearance of a CCTV image with that of the defendant should be avoided.**
- **Bruce, Henderson, Newman and Burton (2001) found that familiarity increased the accuracy of person identification and recommended on the basis of this result that identifications by people familiar with the defendant should be taken seriously, and that the circulation of CCTV images in the media should be made more common practice in attempt to provoke identification by familiar members of the public.**

The need to look beyond quasi-experimental intervention studies when evaluating the effectiveness of CCTV becomes most apparent when the contributions of CCTV to the prosecution process, through the use of recorded footage, are considered. Clearly, this is an issue that goes beyond the scope of experiments designed to assess the immediate impact on crime deterrence, displacement, and detection. Evidence from interviews, and psychological laboratory experiments designed to assess our abilities of identification from CCTV footage, will be drawn on in this section to investigate this issue.

Evidence from interview and questionnaire data

The most striking finding from Owen et al (2006) was the considerable amount of police time that can be saved during the investigation process because of CCTV, allowing this time to then be used more productively. It was widely reported that CCTV can link offenders to a crime, and identify witnesses and victims, making the investigation process more focused; and that it can identify false crime reports, again minimising the amount of time wasted. Furthermore, if CCTV footage is clear, the offender is more likely to admit to an early guilty plea, which again will save police and court time building a case against the defendant. It also became clear, as a result of this study, that the evidence from CCTV footage can help ensure an appropriate outcome to an offence in terms of offender sentencing. CCTV footage can help an officer confirm the type of incident, for example, common assault or Actual Bodily Harm, increasing the potential for a 'just' outcome. It can also help ensure that guilty persons are brought to justice in cases where CCTV footage shows the movements of suspects before and after an incident, linking them to the crime. Of course, this also allows for the elimination of innocent persons from the investigation process. CCTV footage can ensure key pieces of evidence are searched for and seized, by providing a guide to what items of clothing to look for in house searches for example. Furthermore, it was highlighted that CCTV evidence can lead to the prosecution of an offender, even in cases where the aggrieved does not want to press charges, such as

domestic violence occurring in the street for example. Arguably a 'soft' benefit, but still an important one at that, is the increased level of public confidence in the criminal justice system CCTV contributes to, as a result instances such as these where offenders are seen to be 'brought to justice'.

Admittedly, a lot of the findings outlined above are anecdotal in nature, and only some of the benefits are quantifiable. Nevertheless, Owen et al (2006) estimate annual savings to the criminal justice agencies of at least £8,345.18 as a result of early guilty pleas. The authors acknowledge there are great difficulties involved in making estimations relating to the economic benefits of CCTV, and that this remains a real knowledge gap. At the very least, the estimations made in this study simply provide some insight into the potential level of savings. However, had these figures been balanced against the actual costs of installing and implementing the Milton Keynes CCTV project, then the conclusion drawn regarding the economic benefits of the project at the investigation and prosecution level, would have been more informative. This is a necessary focus of future research.

Many of the benefits reported by respondents in the study by Owen et al (2006) were also raised by police interviewees in the study by Levesley and Martin (2005). The portrayal of CCTV as a time-saving tool featured again in many of the officer responders in this study. Forty-nine per cent of respondents said that CCTV had helped them to secure a guilty plea within the month prior to interview. Furthermore, the usefulness of CCTV evidence in indicating the severity of an incident was again, a benefit frequently raised by officers in this study. Although the findings of this study were generally positive, many officers expressed amazement and dismay at the difficulty that courts had with showing images. Most courts are still set up to accept only video tapes, so time and money has to be spent transferring images onto such tapes. One officer also commented that courts generally only had television sets rather than proper monitors on which to view CCTV evidence, and that this had an adverse effect on the quality of the images. This issue thereby demonstrates once again the complexities involved in ensuring the full potential effectiveness of CCTV is realised, and that these complexities extend to potential benefits at the investigation and prosecution level, as well as potential benefits of crime deterrence, and detection, arising earlier on in the intervention process.

Evidence from psychological experiments

Davies and Thasen (2000) investigated the ability to identify suspects from CCTV footage through two experiments. In the first, participants searched for a suspicious incident in a 25 minute surveillance film which was shown either in colour or monochrome. They then attempted to describe or identify the persons involved. Accuracy of identification was just 15% from memory, with a 60% false alarm rate. When judgements were made with access to still-frame images of the target, accuracy rose to 30%, with a 65% false alarm rate. Colour did not improve identification, but did prompt more description of the target's clothing. In the second experiment, participants observed CCTV footage, which included close-up pictures of four targets, before identifying each in target present or target absent arrays. Identification errors were lower on this occasion, averaging 21% when judgements were made from memory, and 13% with continuous reference to the recording. The authors conclude that these results confirm that recognising a previously seen, unfamiliar face, even in the presence of a referent image, is a process which is surprisingly prone to error. It is important to note that the results of this study have been replicated many times before (see for example, Bruce, Henderson, Greenwood, Hancock, Burton, & Miller, 1999; Burton, Wilson, Cowan, & Bruce, 1999) and thus, have practical implications.

These findings suggest that under some circumstances, identification of unfamiliar persons from CCTV footage may be unreliable. While the attempted recognition of persons from CCTV footage is not a primary use of the system, Davies and Thasen (2000) argue that the presence of a permanent image of the appearance of a suspect, and graphic record of the crime, may lead individuals to develop unrealistic expectations of their likely prowess at identification. The real message to take home from this study is that while CCTV footage can be useful in illustrating the physical resemblance between the suspect and the person captured on videotape, the process of eyewitness identification of unfamiliar persons is highly fallible, and so should only ever be used to support other

types of evidence (e.g. forensic), and not as the sole basis of securing a conviction. Furthermore, these results suggest that the practice of inviting individuals unfamiliar with the alleged offender to compare the appearance of a CCTV image, often low in quality, with that of the defendant, should be avoided.

Bruce, Henderson, Newman, and Burton (2001) were particularly interested in the effect of familiarity on identification accuracy. Half of their sample of 120 participants were Psychology students recruited from the University of Glasgow and thus, were familiar with targets in the CCTV footage (staff from the Psychology Department). The other half of the sample were students recruited from the University of Paisley and were thus, unfamiliar with targets in the CCTV footage. In the first experiment included in this study, participants viewed CCTV footage of the target entering a hallway, which they were free to pause and replay as they wished. While viewing this footage, participants were presented with a colour print of a digital photo of either the person featured in the footage or somebody else. The task was to say whether this was the same person featured in the footage or not, and participants could take as long as they wished to make their decision. Participants who were personally familiar with the target in the footage were able to match or reject matches with 93% accuracy. When participants were unfamiliar with the target, overall performance was much poorer, with only 75% accuracy. Familiarity therefore, was found to have a positive effect on the accuracy of person identification.

The authors were then interested in investigating just how familiar an individual had to be with the target before the benefits of familiarity were realised. 'Familiar' participants in the first experiment had likely been exposed to the target on repeated occasions, but what about people who have been encountered much more casually? This was an important question to ask given that, a police officer for example, may claim to recognise an offender on CCTV footage, from a brief encounter related to a previous conviction. In the second experiment, Bruce et al (2001) examined whether a brief period of familiarisation, through exposure to high-quality videos of the faces to be matched later in the experiment, was sufficient to recreate the highly accurate identification performance seen with familiar faces in the first experiment. The results indicated no such significant advantage for briefly familiarised targets. The third experiment involved participants in an additional 'social exposure condition' viewing the high-quality videos in pairs, and talking about the people whose faces appeared. This was designed to simulate something more like a social encounter with the faces to be familiarised. It was found that individuals in this condition yielded a substantial gain in performance at the identification task. These results suggest that it is the nature of exposure to an individual, as opposed to the length of exposure, that will lead to the benefits of familiarisation observed in the first experiment. Bruce et al (2001) propose that 'deep' or 'social' processing of a face is important to the accuracy of later identification.

Again these findings have practical implications. Where the findings of Davies and Thasen (2000) largely raised concerns over the use of CCTV footage for identification purposes in the prosecution process, the findings of Bruce et al (2001) promote its use under certain instances. The results of this series of experiments strongly suggest that when a person is recognised on a CCTV image by someone familiar with them, these identifications should be taken very seriously, even if the CCTV footage is of low quality. Bruce et al (2001) therefore, strongly promote the circulation of CCTV images (still or moving, as there is little evidence to suggest an advantage of one over the other) in the media in order to provoke identification by members of the public that may be familiar with the offender. Indeed, the authors point to the case of the London nail bomber, who was identified, and subsequently convicted, after a close personal acquaintance identified the man from CCTV images that were shown in the newspaper, as an example of the potential success behind such an approach.

Benefits beyond those relating to the impact on crime

The aim of this review has been to evaluate the effectiveness of CCTV through presenting the most recent evidence of the impact it has on crime. The issues of crime deterrence, displacement, detection, and the use of CCTV footage in the investigation and prosecution process, have been addressed. In searching the relevant literature however, it became clear that CCTV has benefits beyond just those relating to the effects on crime. Indeed in conversation, one prominent researcher within the field expressed that, in his opinion, the growth of CCTV across Britain has never about the effect it has on crime. Brief attention will therefore, now be paid to the further potential benefits of CCTV which arguably, should not be overlooked in any review which seeks to address its effectiveness.

Feelings of safety and public confidence in CCTV

Webster (1996) largely attributes a rising 'fear of crime' to the widespread installation of CCTV across Britain. Within his theory, Webster (1996) argues that "CCTV has been accredited with mythical powers in reducing crime and the fear of crime, and thus with creating a 'feel good factor' amongst the general public" (p255). The prospect of improved feelings of public safety following the installation of CCTV in a target area has certainly been the topic of much research. Spriggs, Argomaniz, Gill and Bryan (2005) conducted a series of pre-intervention public attitude surveys across towns/city centres about to install CCTV. An overwhelming 94% of respondents indicated they would be happy to see cameras installed in the town centre, and when asked the reason for supporting the prospect of CCTV, the most frequent response given across all four samples included in the study was '*making the respondent feel safer*'.

Many local authorities have conducted public attitude surveys designed to probe similar issues to those covered by Gill et al (2005) however, the majority of these surveys appear to have been carried out *after* the installation of CCTV in the area. For example, Henderson (2006) reported the results of an 'Opinionmeter' survey carried out across fifteen different locations in South Lanarkshire, resulting in 941 responses. A majority of 61% felt that coverage of CCTV in town centres had made them feel '*a bit safer*' (31%) or, '*much safer*' (30%). Mitchell (2004) carried out a series of public surveys across three town centres covered by CCTV within the district of South Ayrshire: 71% of the 101 people interviewed in Maybole town centre (Mitchell, 2004a); 68% of the 108 people interviewed in Prestwick town centre (Mitchell, 2004b); and 75% of the 103 people interviewed in Troon town centre (Mitchell, 2004c) said that CCTV had made them feel *much* or *a little* safer. Finally, North Lanarkshire CCTV Ltd (2002) conducted a survey across five town centres covered by the company, resulting in a sample of 750 residents. When asked if the CCTV cameras had made a difference in deterring crime and anti-social behaviour 53% said '*yes*' and 32% said '*sometimes*'. Furthermore, 78% of respondents felt they would be less likely to become a victim of crime in an area where CCTV was present.

The results of these surveys would appear to point to the clear conclusion that the installation of CCTV has the desirable benefit of increasing public feelings of safety. Some degree of caution should however, be taken before such a conclusion is arrived at based on the above findings. Firstly, it must be acknowledged that local authorities are arguably biased in that, having just invested considerable amounts of public funds to the installation of CCTV, they will likely want to report only positive outcomes of such projects. Secondly, the possibility that the majority of respondents in these surveys felt safe to begin with remains open as the ability to compare changes in feelings of safety prior- and post-CCTV installation went beyond the scope of these post-intervention opinion surveys.

Ditton (2000) conducted a major survey of crime fear levels experienced by locally resident visitors to Glasgow city centre both before and after the installation of CCTV, and compared those responses to those given by locally resident visitors of two control locations. A total of 3, 074 individuals were interviewed, and of those, there was a majority support for the installation of CCTV, where a majority thought that CCTV would make them feel safer. However, when actual, as opposed to prospective,

feelings of safety were compared over time, there was no improvement after the installation of CCTV in the area. Importantly, of the majority that said they thought CCTV would make them feel safer, 81% had already said that they felt safe. Ditton (2000) therefore, reasoned that prospectively, CCTV “*is not making the unsafe feel safe, it is making the already safe feel safer*” (p702).

The evidence regarding the effects of CCTV on public feelings of safety is therefore, seemingly contradictory, and this thus remains a topic that requires further attention. If future research points to the conclusion that CCTV does generally succeed in making people feel safer, or even that it simply increases public confidence in the government/local authority, where it is perceived as ‘doing something about the problem of crime’, then CCTV could be considered as effective in this respect alone, regardless of whether or not it has any impact on the reduction of crime in reality.

Further benefits

Mackay (2003) aimed to reveal ‘why town-centre CCTV systems are so popular’ by conducting qualitative, in-depth interviews with relevant senior staff involved in the Glasgow CityWatch CCTV project including: the CCTV manager, senior council officer, retail manager, press officer, senior police officer, town centre manager, and a research officer for the Scottish Local Government Information Unit. Two of the main official objectives of this project, as stated from the start, were ‘to cut crime and vandalism by 25 per cent’, and ‘to reduce the fear of crime’. Interestingly however, throughout the interviews, Mackay (2003) reports that there was little claim made by any of the partners, including the police, that town-centre CCTV systems must be supported because they help to reduce crime.

The over-whelming impression from this study is that decisions were taken to support the Glasgow CityWatch CCTV project on the basis that it would assist in a variety of matters that were considered to be important by the decision-makers. All of these matters play a major part in the day-to day concerns of the partners, and the benefits enjoyed by the project were considered to include the following:

- Economic benefits whereby, CCTV promoted an image of a ‘safe city’, which in turn, encouraged people to visit the city centre, use the facilities it has to offer, and ultimately, spend money.
- Management capabilities such as directing police deployment, and responding to problems of traffic congestion.
- Partnership building between the police, councils, and local businesses which in turn, allowed for other community safety issues to be better addressed.
- The satisfaction of public demand for ‘something to be done’ about crime.

The very nature of these potential benefits of CCTV means that their magnitude cannot be objectively measured. Nevertheless, they are important, and although they were expressed in this study by stakeholders and partners of the CCTV project, it should be recognised that the public also are likely to benefit from these additional uses of CCTV. As a lasting thought it is therefore, argued here that there are potential benefits of CCTV that go beyond any direct impact on crime, and that it is important these are not overlooked when the general effectiveness of CCTV is considered.

Conclusions

How effective is CCTV?

The ‘effectiveness’ of CCTV must be considered in light of its intended purpose, as each individual project is installed to serve its own purpose. That said, the rapid spread of CCTV across Britain over the last decade can largely be attributed to claims that have been made regarding the effectiveness of CCTV in terms of crime reduction, and because of this, CCTV evaluations have traditionally focussed on its impact on crime. This review has addressed the most recent evidence with regards to crime deterrence effects, crime displacement effects, the impact on crime detection, and the contributions of evidence captured on CCTV to the process of investigation and prosecution within the criminal justice system. Notably, very little research into the effectiveness of CCTV has been conducted since the year 2000.

Overall, it would seem as though the impact of CCTV on crime has been variable. It would appear that the degree to which CCTV can be deemed ‘effective’ is dependent on its suitability as a crime prevention intervention and this, in turn, depends on the nature of the crime problem to begin with, and characteristics of the area in which CCTV is installed e.g. whether street lighting is yellow sodium or newer white street lighting which gives better CCTV images at night. Furthermore, the belief that CCTV alone will solve the problem of crime is unrealistic. It has been shown that there are many other factors that are likely to mediate the effect CCTV has on crime including police resources, training and level of efficiency of CCTV operators, and the level of communication between these groups. Here the evidence is summarised, and attempt is made to draw some conclusions relating to each of the four objectives based on these findings.

Crime deterrence

The issue of crime deterrence as a potential outcome of CCTV is particularly difficult to evaluate as researchers are faced with the problem of assessing crime that *may have* been observed, had CCTV not been installed in the area. The findings of Griffiths (2002), and Mazzerolle et al (2002) suggest that CCTV may be effective in deterring crime, and in the case of the latter study, anti-social behaviour, but only *initially* upon installation, where recorded instances of crime and anti-social behaviour in both studies gradually increased again with time. It has been speculated that the media may have a role to play in this trend where, initial intensive media coverage may result in an immediate deterrence of crime upon installation, but where a decrease in media attention over time will also lead to diminished deterrence effects. This in theory seems a reasonable suggestion and thus, calls for future research attention.

Gill and Spriggs (2005) have conducted the largest evaluation of its kind to date, covering the impact of CCTV on crime in 14 English towns and cities. On the face of it, the results of this study suggest that CCTV fails to effectively deter crime, where the rate of recorded crime decreased following the installation of CCTV in only one of the target sites evaluated, and in none of the city centres covered in the study. Interestingly however, the most significant and desirable effect of CCTV was found for a train station car park where crime decreased by 73% (from 794 to 214). This result is arguably unsurprising in light of the previous repeated finding that CCTV is most effective in deterring vehicle crime, and crime in smaller and less complex areas. Thus, it becomes clear that the effectiveness of CCTV in terms of crime deterrence is largely dependent on its suitability to the type of crime it is to prevent, and the area in which it is installed.

Further evidence from studies adopting altogether different methods in investigating the potential crime deterrence effects of CCTV does exist. Gill et al (2006) for example, conducted focus groups with convicted murderers with the aim of uncovering whether CCTV may have deterred them from committing their crimes. Although anecdotal in nature, the evidence from this study generally reflects what has already been discovered in objective evaluations and previous reviews of the literature – that

the deterrence effects of CCTV appear largely minimal, and the likelihood of crime deterrence effects are diminished further when the offender in question is under the influence of alcohol.

Crime displacement

Gill and Spriggs (2005) found no significant evidence of spatial displacement of crime to a surrounding control area. Interestingly however, these authors did find evidence to suggest that spatial displacement can occur on a smaller scale than perhaps previously thought possible where, for one of the target sites in their study, a decline in recorded crime was noted for the area within 100 metres of the cameras. Griffiths (2003) found evidence of an initial diffusion of benefits in the control area in the form of a 22% decrease in recorded crime during the first 12 months following the installation of CCTV in the target area. Again, the suggestion was put forward by the author that increased media interest upon installation of the project may have been responsible for this initial effect but, once offenders had worked out where the cameras were, with time, this effect wore off.

The recent evidence regarding the topic of potential displacement effects is minimal and therefore, does not add much insight to this already inconclusive topic. It does however, appear that in reality, spatial displacement of crime does not present as much of a problem as it could in theory. Anecdotal evidence from focus group discussions with offenders in Gill et al (2006) does indeed support this assumption where displacement effects were said to be only partial. One new and interesting idea however, to have emerged from this study, was that displacement to a different type of crime following CCTV installation may be an issue of concern. Traditionally, there has been a bias in attention towards spatial displacement in previous CCTV evaluations. The issue of displacement to another type of crime should therefore, be investigated further in future research.

Crime detection

The problem in using recorded crime statistics as a measure of the effects of CCTV is that an increase in such figures could reflect improved crime detection, as opposed to an actual increase in crime (and thus, failure in terms of crime deterrence). Two recent studies that have supplemented recorded crime statistics with other crime outcome measurements have resulted in interesting findings. Farrington et al (2007) found that victimisation survey data did not significantly change for either the target area of Cambridge or the control area, whereas police-recorded crime statistics decreased by 15% in the control area compared to the target area following the installation of CCTV. Similarly, Sivarajasingham et al (2003) observed an overall decrease in assault related emergency department attendances, and an overall increase in police recorded violent crime statistics across the five target areas covered in their study. These findings therefore, suggest that CCTV is more effective in terms of improved detection of crime, than it is in terms crime deterrence effects. The findings of Sivarajasingham et al (2003) are particularly interesting given that they relate specifically to violent crime. The repeated finding that CCTV has little success in deterring violent crime may lead to the acceptance that CCTV does little to improve instances of violence. It would appear however, that CCTV may benefit the issue of violent crime through increased rates of detection, if this in turn is followed by a quick police response. The extent to which this potential benefit of increased detection is realised in reality however, has been discussed as being dependent on a variety of factors beyond just the quality of CCTV itself.

Interviews with the police such as those conducted by Owen et al (2006), and Levesley and Martin (2005) have provided an insight into the benefits resulting from the increased detection of crime through CCTV. Such benefits were said to include the following: a reduction in time spent on the investigation process, information to guide the deployment of officers, and the prevention of minor incidents escalating into more serious ones. Owen et al (2006) placed an economic value on these benefits at an estimation of savings up to £1,601,600 a month. This is an issue that requires further future attention. Nevertheless, regardless of its potential economic value, the anecdotal evidence to suggest CCTV is a resource valued highly by the police, due to the contributions it makes to their work in terms of increased crime detection, is strong.

The use of evidence in the investigation and prosecution process

The most striking finding from police interview data collected by Owen et al (2006), and Levesley and Martin (2005) is the considerable amount of time that can be saved during the investigation process due to the use of evidence found in CCTV footage. This is predominately due to an increase in early guilty pleas in the face of strong video evidence through which Owen et al (2006) have attributed an estimated economic annual saving of up to £8,345.18. Nevertheless, the extent to which these benefits are realised is a complex process dependent on many other factors. Indeed, many of the officers interviewed by Levesley and Martin (2005) expressed dismay and amazement at the difficulty the courts had with showing images. It was reported that many are still only equipped to accept video tapes. Advances in the digital technology behind many CCTV systems today therefore, means that it is likely evidence from CCTV footage is not yet being used to its full advantage.

Davies and Thasen (2000), in their psychological laboratory experiment, found that recognition of an unfamiliar individual from CCTV footage is a highly fallible process. Indeed the high rate of identification errors observed among participants in this study has been replicated many times before in previous investigations of human face perception ability. These authors therefore, concluded that the practice of inviting individuals unfamiliar with the alleged offender to compare the appearance of a CCTV image with that of the defendant should be avoided. Bruce et al (2001) however, found that familiarity has a significant positive effect on the accuracy of person identification, particularly where deep or social processing of the face has occurred. On the basis of this finding, Bruce et al (2001) promote the circulation of CCTV footage in the media as an attempt to provoke identification by members of the public that may be familiar with the offender. Therefore, while anecdotal evidence of the actual contributions CCTV makes to those working in the criminal justice system is available in the form of interview data, evidence from psychological theory and experimentation has allowed for suggestions to be made as to how evidence from CCTV footage should be used in the future to ensure the most just and reliable outcome for the criminal justice process.

Further benefits of CCTV

The effectiveness of CCTV has traditionally been evaluated in terms of its impact on crime. Nevertheless, there is some evidence to suggest that CCTV may increase public feelings of safety, although, overall the reality of this issue is not yet clear due to conflicting findings. There is an argument to be made however, that if CCTV is in fact successful in making people feel safer, then it is in this sense effective, regardless of any actual impact it has on crime. Furthermore, consistent with the argument that the installation of CCTV has little to do with crime, is evidence from Mackay (2003) suggesting that CCTV systems are largely supported due to benefits unrelated to crime such as management capabilities, satisfaction of public demand, and positive effects on city centre economies. In conclusion, CCTV appears to result, not only in increased crime detection and evidence useful to the process of investigation and prosecution, but also in a wide range of other benefits beyond an impact on crime. It has been argued that these 'extra' benefits are highly valued by those working alongside CCTV and thus, should not be overlooked when the effectiveness of CCTV is considered.

Priorities for future research

This review of the most recent research evidence into the effectiveness of CCTV has highlighted many issues that require further attention before firm conclusions can be made. The following is therefore, a list of priorities for future research:

- Researchers need to adopt a more longitudinal approach to their evaluations of the impact of CCTV on crime in the future, in order to gain a better insight into the associated long-term effects. This is especially important to the issue of deterrence effects, which have appeared to be particularly short-lived from the studies reviewed in the present report.
- The role of the media coverage and public awareness of CCTV in deterring crime needs to be investigated. Many authors have suggested that the initial, short-lived deterrent effects observed in their evaluations may be attributed to initial high levels of coverage surrounding the installation of CCTV. If this was known to be the case, then attempts could be made at maintaining high levels of public awareness in order to sustain initial positive effects on crime.
- Future research needs to be carried out into the effects of CCTV on anti-social, non-criminal behaviour, to establish if these differ from those on crime. More attention has been paid to crime effects in the past however, the desire for the installation of CCTV in response to the problem of anti-social behaviour is becoming increasingly common, suggesting a shift in attention to the effects on anti-social behaviour in particular is appropriate.
- More consideration needs to be made of displacement in terms of a shift to another crime, whereby there has been a bias in the past towards investigating spatial displacement effects. Some anecdotal evidence was found in this review to suggest that displacement to another crime may also be an impact of CCTV.
- In light of the great expense of CCTV, its economic benefits, particularly in relation to the savings gained through early intervention and use of evidence in court, must be a focus of future research. In order to gain a true picture of the associated economic benefits, savings in these respects need to be balanced out against the cost of installing and maintaining CCTV in the first place.

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