

Article

THE EFFECTIVENESS OF REDEPLOYABLE CCTV

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Abstract

Although there is some published research on CCTV almost all of it is on static CCTV. Yet there is emerging a popular different type, one that can be moved around to deal with crime hotspots as they arise. The flexibility and the fact that it is perceived as more cost effective add to its appeal. However, until now redeployable CCTV has attracted very little comment. The paper discusses an empirical research study assessing its effectiveness and then attempts to highlight some of the policy implications. What is clear is that if the potential of this technology is ever to be realized, it will need to be managed very differently.

Keywords

CCTV; security measures; situational prevention

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Introduction

Redeployable CCTV (RCCTV) is a specific method of CCTV-based surveillance. Unlike static CCTV, where cameras are permanently installed in one location, and mobile CCTV systems, which are often operated from vehicles, RCCTV is designed to be moveable and fast deployable across a number of fixed locations within an area. Such locations range from lampposts and buildings to dedicated erected poles. RCCTV offers certain advantages over static systems including adaptabil-



ity, flexibility and generally being less expensive to purchase. However, such systems also come with disadvantages. Gill *et al* (2005a) point out that RCCTV is a new technology that is still evolving and so to is the process of finding the best ways of managing it. Although the use of RCCTV is becoming more widespread, most research has to date focussed on static CCTV systems.

Thus, this article aims to help fill a gap in knowledge. It is based on understanding the effectiveness of RCCTV, drawing on police recorded crime figure and public attitudes towards fear and worry about crime. The findings are derived from a national evaluation of CCTV in which two redeployable schemes were included (Gill and Spriggs, 2005). This article explores the findings on redeployable schemes in more detail.

Why choose RCCTV?

CCTV has become an important crime prevention and security measure, which has been subjected to fairly extensive evaluation (e.g. Phillips, 1999; Sarno *et al*, 1999; Ditton, 2000; McCahill, 2002; Newburn and Hayman, 2002; Welsh and Farrington, 2002; Gill and Spriggs, 2005; and see Farrington and Painter, 2003). Cameras collect images, which are transferred to a monitor-recording device of some sort, where they are available to be watched, reviewed and/or stored. CCTV is a situational measure that enables a locale to be kept under surveillance remotely. This makes it possible for the police, and other law and regulatory agencies such as private security, to respond to incidents when alerted, and to have information about what to look for when they arrive. Tilley (1993) (and summarized in Gill and Spriggs, 2005) identifies a number of mechanisms by which CCTV works. These include offenders being caught in the act, offenders being deterred from committing crime in the area, and increased reporting through increased public use of surveilled areas and consequent natural surveillance. The intended mechanisms of RCCTV are no different. However, due to their nature, redeployable systems permit surveillance of localized problems where static cameras are not available. For this to be successful, careful consideration must be given to each deployment decision, and camera positioning must be informed by intelligence.

RCCTV is often favoured because it can be rapidly deployed and it is flexible. Redeployable cameras can also cover a large area at less expense than static cameras, at least this is how it is often presented. However, while it can be argued that the cost of viewing a square mile per day would be no different than conventional CCTV, RCCTV is used as a cost-effective solution to cover a wider target area that does not warrant a static system for whatever reason. Albeit that the area is not completely covered for 100% of the time. These points are perhaps best illustrated by reference to two case studies.

Borough¹ consists of 25 wards, the majority of which are in the most deprived half of the Index of Multiple Deprivation,² although crime levels are

lower than the average for England and Wales. However, a community safety survey³ in the area revealed discontent about levels of disorder and quality of life. In all, 72% of respondents were “not satisfied that enough is being done to tackle crime and anti-social behaviour in their area”. The three main town centres in the area are already covered by static CCTV so a system was required to provide coverage in the surrounding suburban and rural areas as and when needed. In a joint police and borough council driven project, eight digital pan, tilt and zoom (PTZ) cameras were purchased, which can be fitted to any lamppost in the area with an electrical supply outlet – so that images can be transmitted using power lines – making maximum use of the system’s versatility. Two dedicated computers were also purchased to conduct real-time monitoring of the cameras. One is used by the police and the other is in a control room, which also monitors the static systems located in the nearby town centres. Deployment decisions are made by the police. Regular meetings are held to discuss recent crime trends and where the system will influence the most crime, the most quickly. The primary objectives of the scheme were to tackle localized crime hotspots, which police intelligence helped identify (mostly burglary, vehicle crime, criminal damage and anti-social behaviour) and not previously covered by CCTV, and to contribute to the borough’s “Public Reassurance Agenda”.

The other scheme, called “Deploy Estate” lies in a relatively affluent borough containing pockets of high deprivation. The three wards that comprise the intended target area all fall within the most deprived half of the Index of Multiple Deprivation. These wards exhibit social and economic difficulties and associated crime problems. In particular, vehicle crime (including arson), burglary, criminal damage and intimidation. Deploy Estate’s target zone comprises five individual areas that have been identified as being especially suitable for RCCTV, three of which are residential, one a shopping parade and the other outside a railway station. Town centres in the nearby area already have static CCTV. A multi-agency driven project (including the police, the housing association and the local authorities) secured funding for 11 PTZ cameras and 19 fixed CCTV specific poles, which are distributed throughout the five areas. Eight fixed lens cameras were also purchased. These can be mounted on the poles alongside the PTZ cameras. Monitoring of the cameras takes place from a pre-existing control room, which operates the town centre systems. Much like Borough, deployment decisions are intended to take an intelligence-led approach. The partnership funded an analyst for this task whose job it is to provide up-to-date hotspot locations. The primary objectives of the scheme are to address car crime, criminal damage, anti-social behaviour and disorder throughout the area as and when needed. Ultimately, the aim is to improve residents’ quality of life.

These two schemes share many similar characteristics, in both cases CCTV is installed in nearby town centres, the type of camera used is similar, a pre-exist-

ing control room and its operators are used for monitoring. The schemes also offer different types of flexibility. In one system, the cameras could be installed on any one of 19 fixed poles in small designated areas. In the other system, the cameras could be installed on numerous lampposts throughout the borough.

The impact of RCCTV

The approach

Measuring the impact of CCTV is itself a complex issue. The Campbell Collaboration (Farrington, 1997; Welsh and Farrington, 2002) has advocated that the minimum acceptable standard for a review based on police recorded crime data alone is Level 3 of the Maryland Scientific Methods Scale (Sherman *et al.*, 2002). This requires a measurement of the incidence of crime before and after the installation of CCTV, in both a target and control area. In practice, such requirements are constrained by the difficulty of identifying a suitable control for each target area and the unavailability or poor quality of police crime data (Gill and Spriggs, 2005). RCCTV compounds these issues further. In a static system the target area is covered by a fixed number of permanently installed cameras (ignoring issues such as equipment failure). However, within a redeployable system, the number of cameras and the period for which they are deployed can vary over time. The “year after implementation” data will therefore include areas where cameras were not present for the whole period.

With this in mind, the method used to assess the impact of RCCTV attempted to answer the following questions using police recorded crime data and public attitude surveys.

- What was the overall impact of RCCTV in the target area?
- What was the impact of individual cameras?
- Did RCCTV meet its objectives?

Qualitative data collected in field visits to each site were also used. This included control room characteristics noted during field visits, interviews with control room operators and focus groups with members of the public.

The first task is to measure the absolute change in crime for each system following the installation of CCTV. In both cases, crime levels in the 12 months prior to installation were compared with levels for the 12 months following the systems’ “live date”.⁴ This was performed for both a target area and a comparative control area where social characteristics are similar and there has been no installation of CCTV within a year of the live date in the target area. Results are given as the difference between recorded crime levels before and after implementation, expressed as a percentage of the level in the pre-installation period. A measure of statistical significance is also provided. The Relative Effect Size (RES), based upon an odds ratio (Gill *et al.*, 2005b), compares the

change in recorded crime levels in a target area with that in the control to provide a relative measure of the difference between the two. Where this is greater than 1, there was either a *reduction* in recorded crime levels in the target area relative to the control, or a smaller *increase* in the target relative to the control, so that in effect there has been a relative fall in the target area crime levels. Whether or not the difference between the target and the control is statistically significant depends on the width of the confidence intervals, which are calculated using the standard error of RES (see Gill *et al*, 2005b).

Investigating the impact of particular cameras or groups of cameras can give an indication of how they are affecting localized crime hotspots. This analysis was conducted slightly differently in each scheme due to the differences in their flexibility and scale of use. In Deploy Estate, each of the five separate areas were treated as individual target areas. There was always at least one camera in each area during the after period; therefore, the crime data analysis described above was appropriate. In Borough, however, cameras were analysed individually because there were no set “target” areas upon which the cameras were designed to impact over a particular length of time. Crime levels were monitored before a camera was installed, while the camera was in operation and after the camera was taken away. It was rare for cameras to be installed in one location for over a year, so before, during and after removal periods are all based upon the length of time of each particular deployment, that is, during implementation.

The crime data analysis above has been supplemented using GIS visualization techniques and time series analysis. Such techniques are used to explore the spatial and temporal trends within the recorded crime data. Temporal crime trends were investigated by plotting line graphs indicating the evolution of crime over time, particularly 2 years prior to and after the installation of RCCTV.⁵ Such time series graphs can be produced for any area of interest using GIS. This allows us to compare crime trends in a target, control and buffer areas for example. GIS was also used to produce density maps (Bailey and Gatrell, 1995) of crime. Using such maps for different time periods crime hotspots and their temporal nature can be identified, which allow us to determine where, if at all, changes in crime have occurred and whether these coincide with particular RCCTV deployments. Public attitudes towards CCTV were assessed in each area, but the methods used differed due to the nature of each system. In Deploy Estate, surveys were carried out in two of the five areas (both residential) covered by RCCTV, before and after the CCTV systems were installed. Respondent households were selected at random from all households within the area for both before and after implementation. Therefore, the same respondents were not necessarily interviewed during each period. The surveys were designed to assess the extent to which fear of crime had been reduced. They also measured whether the introduction of CCTV in an area changed public opinion; for instance, whether public support for CCTV declined once

residents had experience of it. This is particularly significant in residential areas where the large-scale installation of CCTV cameras is a relatively new concept.

Due to the unpredictable nature of deployments within Borough, it was not possible to conduct a before/after public attitude survey. Instead, focus groups were carried out – after installation – in two areas in which redeployable cameras in Borough had been installed. Their purpose was to explore how much the presence of the CCTV camera(s) affected the people living in these areas. The following issues were discussed:

- Crime and disorder problems experienced.
- Awareness of RCCTV installed in the area.
- Opinions about RCCTV installed in the area.
- RCCTV's perceived impact.
- Feelings about RCCTV's temporary nature.

Borough

Police recorded crimes and incidents were analysed for 1 year before and after implementation of RCCTV. A target area (that is, a defined area where a crime reduction measure such as RCCTV is designed to have an effect) was not specified as such due to the variable nature of deployments. Therefore, the immediate area around each camera (100 m radius from camera) deployed during the year after implementation comprises the target. The whole of the division was used as a control.⁶ During the evaluation period the cameras were deployed on 22 occasions and for periods of between 2 weeks and 14 months.

After implementation, police recorded crime increased by 73% in the target and by 12% in the division, a significant increase in the target area relative to the Division as a whole. The same pattern occurred for incidents,⁷ which increased by 43% in the target and only 6% in the Division. Table 1 shows the change in overall crime and targeted offences within the target and division 1 year after installation.⁸

The data suggest that RCCTV has not associated with a reduction in crime in the majority of crime categories. Only in violence against the person was there a positive result (an increase of 25% in the target area compared with a 62% rise in the divisional data). Neither the increases in overall crime nor the reduction in violence can be explained with reference to the cameras, and are perhaps best attributed to reasons unknown and unconnected with CCTV (see Gill and Spriggs, 2005). This conclusion is supported by the study of impact of individual cameras.

Impact analysis of individual cameras concentrated upon three particular deployments where focus groups⁹ took place. Any impacts observed can therefore be investigated in the context of how the public viewed RCCTV.

Table 2 shows the number of crimes and incidents occurring per month in both the target and buffer¹⁰ areas before, during and after each deployment. In all cases, the number of offences during implementation increased relative to the before period. Numbers of offences then fell again when the cameras were taken away. This coupled, with the impact noted in Table 1, could suggest the cameras are catching offenders in the act or that they have encouraged reporting in these areas. However, qualitative evidence from the control room study suggests otherwise, as outlined below. The system experienced severe technical and monitoring difficulties. Viewing live footage from the cameras proved problematic: footage was slow to transfer, and there was a time lag of up to 3 s between the camera capturing the image, and seeing the image on screen. There was also a lag time in the telemetry, making the cameras difficult to control remotely. The system was not user-friendly for real-time monitoring due to the time lag, and was only monitored between 7 and 30 h a month. This effectively made the system reactive. Also the police made limited use of the

Table 1 Borough – change in overall crime and targeted offences for 1 year before and after installation in Borough

<i>Objective: to reduce</i>	<i>Absolute target change</i>	<i>Target change (%)</i>	<i>Absolute division change</i>	<i>Division change (%)</i>	<i>Is this significant (P < 0.05)</i>	<i>Relative effect size</i>	<i>Confidence limits</i>
Overall crime	257–444	73	8250–9225	12	Yes	0.65	0.57–0.73
Burglary	27–49	81	1448–1559	8	Yes	0.59	0.29–0.9
Criminal damage	82–183	123	2179–2330	7	Yes	0.48	0.30–0.6
Vehicle crime	42–73	74	1754–1773	1	Yes	0.58	0.31–0.86
Violence against the person	35–44	25	785–1270	62	No	1.29	0.16–2.42

Table 2 Impact of individual cameras in Borough where focus groups were also conducted to investigate the public’s opinions of RCCTV

<i>Area</i>	<i>Before (numbers of per month)</i>	<i>During (numbers of per month)</i>	<i>After (numbers of per month)</i>
A (target crimes)	2.9	4.3	2.3
A (buffer crimes)	9.0	5.7	5.1
A (target incidents)	0.2	0.4	0
A (buffer incidents)	1.3	1.6	1.0
B (target crimes)	6.6	11.2	10.2
B (buffer crimes)	1.6	2.1	1.7
B (target incidents)	4.8	9.2	4.5
B (buffer incidents)	0.7	4.6	3.3

recorded images. They accessed the recorded images approximately 300 times and useful footage was available on only four occasions. Time series analysis shows a division-wide increase in crime as the project was implemented, see Figure 1 below. This explains both the increase in overall crime and the increase of crime around individual cameras. The rises in both recorded crime and incident levels are best attributed to a change unconnected to RCCTV.

Participants in the focus groups reported high levels of fear of crime caused by disorder in their residential streets and experiences of victimization. The main problems were perceived to be caused by young people congregating in the street and throwing objects at passing vehicles, being drunk, joyriding and committing criminal damage. The presence of the cameras gave many residents an initial feeling of security and safety:

When they're up there it gives you a sense of security, because you think, well, if somebody does do something to our property I know there's a camera that hopefully will catch them, so you do feel a bit safer, that way.

Although the participants reported a positive impact on fear of crime, they were also very aware of the temporary nature of the cameras. Both the police and the council report a number of calls of complaint from residents when cameras were removed from their street.

You can't put a value on peace of mind and people gain that peace of mind when they get the camera and they can't breath easy as they know they have only got a few months of peace and quiet and then it is going to erupt again and have not gained that peace of mind fully. ... when you are talking of quality of life, if you are suddenly shown how it could be – pleasant, relaxed, being able to walk home at night after your late shift not worrying, then it is worse to then take it away again.

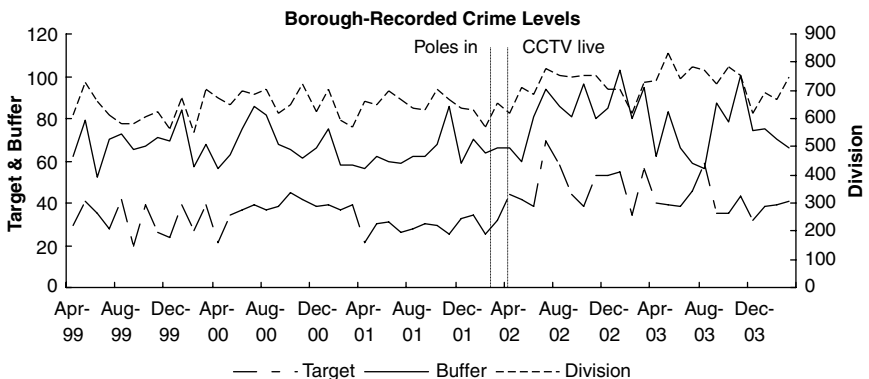


Figure 1 Time series analysis – recorded crime levels in Borough.

Public perceptions suggest that the cameras tended to displace the crime and disorder problems to adjacent streets. However, crime data analysis does not support this view. The results from both the overall analysis and the individual cameras show that there has not even been a decrease in crime in the target area. What the residents really wanted was a permanent solution:

The mobile camera is fire fighting and what they would like is permanent peace of mind.

Some of the residents noticed that the cameras were on auto-pan and knew they were not being effectively monitored, which reduce their confidence in the cameras and their ability to reassure residents.

I think you are missing the point. The camera solved them when it was put up, now they have realised that it just goes like this, like this and doesn't go like this so they have now got wise to it. The camera actually solves the problem if it is properly managed... We need it to do its job properly and then the police to respond to the job its doing. They are then extremely effective.

Some felt an increased feeling of security as a result of the cameras, but there was limited support for the suggestion that the presence of cameras might encourage residents to use areas they currently avoid because of worry about crime. It was felt that successful detections or prosecutions should be publicized, and this did not occur in either of the participants' residential areas. The residents received no feedback from the police about the cameras and their impact, and this could have played a vital role in the police reassurance agenda. Overall, any initial reassurance effect was diminished over time as it became evident to residents and the youths that no one was responding to the images.

In summary, the focus group with local residents showed that, initially, the cameras reduced fear of crime. However, the focus group respondents also commented, the problems returned when the youths realized the cameras were on auto-pan and the police were not responding to the images. This reduced the residents' positive feelings about CCTV, which were further tainted by the fact they knew the cameras were a temporary measure, as reported in the local media. Overall, RCCTV in Borough does not appear to have met any of its objectives.

Deploy estate

In total, 11 PTZ cameras were deployed across 19 fixed poles distributed over five specified target areas. In addition, eight fixed lens cameras were deployed in these areas.

Recorded crime rates in the 1 year before and after CCTV was installed showed a 21% increase, while there was only a small increase in the control

area (3%) (see Table 3).¹¹ The system has not met its overall objective of reducing crime.

Following the installation of CCTV, criminal damage is observed to have increased significantly across all five target areas. This was mostly due to the large increase observed in Area C (see Table 4). The year before the cameras were installed, there were an average of 13 criminal damage offences a month in this area. This rose to an average of 29 offences per month following installation of CCTV, with a peak of 58 offences per month. Further analysis and discussions with the local police did not reveal any reason for this increase. A small proportion of the increase in criminal damage could be accounted for by damage to the cameras themselves. The cameras were installed in a highly sensitive area and several were vandalized.

Although reducing burglary was not a stated objective it appeared to show the most positive results with the target area experiencing a reduction of 23%, which was not mirrored in the control area (although the difference between target and control was not statistically significant).

Table 3 Deploy Estate – change in overall crime and targeted offences 1 year after CCTV installation

<i>Objective: to reduce</i>	<i>Target absolute change</i>	<i>Target change (%)</i>	<i>Control absolute change</i>	<i>Control change (%)</i>	<i>Is this significant (P<0.05)</i>	<i>Relative effect size</i>	<i>Confidence limits</i>
Overall crime	760–917	21	534–548	3	No	0.85	0.63–1.07
Criminal damage	296–456	54	153–136	–11	Yes	0.58	0.35–0.81
Burglary	81–62	–23	64–104	63	No	2.12	0–4.54
Vehicle crime	164–152	–7	107–95	–11	No	0.96	0.58–1.33
Violence against person	110–118	7	120–118	–2	No	0.92	0.53–1.3
Public order	17–19	12	13–23	77	NA	NA	NA

Table 4 Change in crime levels in individual target areas

	<i>N crimes 1 year before (Nov 01–Oct 02)</i>	<i>N crimes 1 year after (Mar 03–Feb 04)</i>	<i>Changes in crime (%)</i>
Area A	71	48	–32
Area B	208	217	4
Area C	349	547	57
Area D	109	78	–28
Area E	23	27	17

Table 4 shows disparities between the changes in crime rates across the five evaluation areas ranging from a 32% decrease in recorded crime to a 57% increase in area C. This suggests that some crime hotspots may have been targeted more successfully than others, or that particular areas are more susceptible to their impact

The large increase in Area C governs the overall rise in recorded crime levels. Time series and GIS analysis has revealed the increase is dominated by a number of peaks after the installation of RCCTV. Both the buffer and control areas experienced similar, yet less marked, peaks in the data. The same trends were occurring across the division. The rise cannot be attributed to RCCTV.

The public attitude survey was carried out in two of the evaluation areas (Areas B and C) and the control area. There was no significant change in fear of crime in the target area compared to the control area. In Area C, there was a 3 percentage point decrease in worry about crime, before 33% ($n=106$) after 30% ($n=89$), which was the same as in the control. In Area B, there was a slight decrease in the level of worry about crime, before 28% ($n=89$) after 27% ($n=82$). These findings suggest that CCTV had little or no impact on fear of crime levels.

There has also been little effect of RCCTV on crime and the fear of crime in Deploy Estate. None of the objectives were met. Qualitative evidence indicates that the system was not monitored in a way that would increase the number of detections of crime brought about through immediate deployment of police resources to scenes of crime and the subsequent arrest of offenders. Collectively, the target areas were monitored for only 2.6% of the total time it was operational because the cameras were “boring” to watch. In comparison, the nearby town centre systems being monitored from the same control room were observed from 5 to 55.9% of the time. If an offence was not spotted by the operator, there was a good chance that it would not be caught on tape, as the cameras did not pan on automatic tour and only moved when the operators were actively controlling them. Consequently, an offence would have to take place within view of the cameras to be captured. Moreover, good quality footage was recorded in daytime only, as the images at night were of poor quality. Targeting the cameras also proved to be a problem. Data supply issues and lack of involvement by partners resulted in deployment decisions being made by the police on anecdotal evidence. Communication between the police and operators was also less than ideal as only a one-way radio system (police to control room only) was installed.

Discussion

In terms of reducing crime levels and increasing feelings of safety, RCCTV has not been successful in the two schemes analysed. In Borough, overall crime and all individual offence types except violence were seen to increase across

the board. Interestingly, the analysis of individual cameras showed short-term crime trends to increase when the cameras were installed. Similarly, Deploy Estate experienced a rise in recorded crime levels when the cameras were installed. Possible explanations include RCCTV has increased either detection of offences or encouraged reporting in the area. However, both schemes encountered specific difficulties with the set up of their systems rendering them reactive at best suggesting increased detection was not plausible.

The case studies presented here highlight a number of issues common to all RCCTV systems that need addressing. Management of the system, from system design to control room operation, is fundamental. Understanding exactly the resources needed, who will provide them, who controls them, how they work, how much they cost and how the system has been designed to reach its objectives are critical. Although it has only been briefly touched upon within this article, both schemes experienced trouble in this area and this has been discussed more fully elsewhere (see Gill and Spriggs, 2005; Gill *et al*, 2005c). Both systems were designed to target crime hotspots through intelligence-led deployments. However, lack of time and revenue from partners and technological failure prevented the systems from operating as intended. Deployments were long-term and the system could only effectively be used for gathering evidence after an offence occurred due to control room design. Ultimately, this impacted upon their effectiveness. Gill *et al* (2005a) have outlined a set of guidelines to assist those purchasing and using redeployable systems.

Due to their nature, RCCTV systems are designed to react to specific problems and this often involves the deployment of a single camera. Even where more than one camera was deployed in the same area they did not always interlink. Operators of RCCTV commented on this fact: they were unable to pursue offenders from one area to another, which is a daily requirement. Such issues need to be taken into account when designing a system and making deployment decisions.

Camera type is also important. Both schemes used box type cameras, which are highly visible, sending both a message of reassurance to the public and a word of warning to potential offenders. However, box type cameras make it much easier for offenders to monitor where the cameras were pointing, and consequently, calculate how likely they were to be captured on CCTV, at least according to residents. Given that the cameras rarely moved due to technical reasons in both systems, it was relatively easy for offenders to evade being captured by CCTV, simply by moving to another part of the estate. It is quite possible that offenders chose to offend “behind the cameras’ back”. The extent of the offenders’ avoidance behaviour and the locational and temporal accuracy of recorded police data determine the success in measuring such a problem. Our analysis did not assess this because it requires a detailed timetable of exactly when and where each camera was positioned and this information was not always available. There are pros and cons to all types of cameras and for that matter to all types of systems (Gill, 2006).

RCCTV is theoretically less expensive than providing a continuous static system that would require far more cameras. However, due to the more complex nature of RCCTV and therefore the technology involved, cost can work out to be more per camera than a static system. Gill and Spriggs (2005) provide an economic evaluation of 13 CCTV systems, including both Borough and Deploy Estate. The average cost per camera for a static system is £16,047, whereas for Borough and Deploy Estate this figure is £25,005. Although RCCTV maybe a less expensive method of covering a broad area than a static system because fewer cameras are used, if the system is not operating correctly the benefits in cost cannot be realized.

On this evidence, it is tempting to rule out RCCTV as a credible solution to crime problems, such a conclusion is premature. First of all, is it reasonable to assume a long-term impact upon police recorded crime from what is designed to be a short-term measure? Aside to this our analysis is based upon two systems that are not operating as intended and not being used to their full capacity. In other words, the systems were not fully implemented. It should perhaps come as no surprise that they did not produce a favourable impact on crime and the fear of crime.

Finally, our analysis is dependent on accurate temporal and spatial attributes of recorded police crime data. RCCTV projects are more sensitive to the accuracy of these attributes than conventional target areas. For example, police data is often geo-referenced by the postcode of the nearest property to the offence. Publicly committed crimes are referenced in the same way. This is not as important for conventional target areas, which may include a number of cameras with continuous coverage. However, RCCTV generally involves a small target area of single cameras and the accuracy of the recorded times and locations of crime becomes increasingly important. Especially, given such data will be used in the creation of police intelligence and consequently in guiding each deployment of RCCTV.

Conclusion

This paper has explored the impact of RCCTV in two different schemes, which differed in terms of system design and the geographical area covered, but were similar regarding cameras used, reasons for implementation and objectives to be tackled. Results from the analyses of impact are discouraging. Although there were small successes in each system none of the main stated objectives were met. The reasons behind this apparent failure have been discussed; however, it must be acknowledged that these are the results from two RCCTV schemes only.

We can not claim that if all the shortcomings mentioned above are overcome, then the impact of the cameras would have been more favourable, because as yet such a system has not been implemented, or at least evaluated. However,

lessons are presented here, which point towards the necessity of a detailed and realistic view of what RCCTV is capable of and intended to achieve. Use of realistic objectives to drive implementation, backed up by good management strategies and strong staff support, are central to the success of any project.

What is important to take from this article is that RCCTV is not a quick and easy solution to combating crime problems, and it is not a cheap and cheerful method of reassuring the public. RCCTV is a more complex venture than conventional static systems and this is reflected in the importance of system design and management. The objectives of the system are critical and need to be matched against what RCCTV is realistically capable of accomplishing with the resources available.

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Notes

- 1 The locations of each system have been made anonymous to protect the identity of the projects subject to evaluation.
- 2 The Index of Multiple Deprivation is an overall measure/score of an area's deprivation based on a number of variables. These include income, employment, health, education, access and environmental related variables (see ONS 2004 for further details).
- 3 $N=607$. This was conducted before implementation of CCTV.
- 4 Where the live date is the point at which some cameras in the system send images to the control room, which are then monitored.
- 5 Dependent on the police crime data available.
- 6 It can be argued that the division is not a suitable control for a small target area; however, Gill and Spriggs (2005) found little difference in impact between target – control and target – division comparisons.
- 7 Incidents are anything that is reported to the police. An incident becomes an offence when the circumstances reported amount to a crime defined by law and there is no evidence to the contrary.
- 8 It must be acknowledged that not all cameras were present for the whole year after implementation.
- 9 Focus groups were convened by local councillors and authority workers. No more than 14 people attended any of the meetings. All attendees were local and had been living in the area for a minimum of 2 years, the majority longer. Three researchers were present; one conducted the interview while two acted as scribes.
- 10 The buffer area is an area surrounding the target area and is investigated for effects such as spatial displacement and diffusion of benefits. The exact designation of each buffer area varied between projects depending upon the locality and particular attributes of the relevant target area. As a general principle, a mile buffer was established from the perimeter of the target area and included those areas believed to be the most susceptible to geographic displacement. However,

the existence of administrative boundaries (police beats) or physical boundaries including rivers, railway lines, major roads and other geographical features such as change in land use were used to define the actual boundaries of specific buffer areas. Such physical boundaries were based on the premise that it was unlikely that an offender would cross over them in order to commit the same offence. Smaller scale investigation was conducted using a 100m buffer around each camera's coverage.

11 The control area used in assessing Deploy Estate was another estate very close to and of a similar size to the largest of the individual target areas.

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