



Crime Detection and
Prevention Series
Paper 68

CCTV in Town Centres: Three Case Studies

Ben Brown

CCTV IN TOWN CENTRES:
THREE CASE STUDIES

Ben Brown

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Editor: Barry Webb
Home Office Police Research Group
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Police Research Group: Crime Detection and Prevention Series

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Foreword

Recent evidence indicates that nearly half of all metropolitan and non-metropolitan councils already have installed closed circuit television (CCTV) within their town centres. However, very few of these systems have been systematically evaluated. There is growing concern at this lack of evaluation, particularly amongst retailers who contribute significantly to the financing of many of these systems.

Results from earlier studies published by the Home Office indicate that CCTV can, in certain circumstances, make a useful contribution to crime control. This report takes forward the results of the earlier work by examining CCTV schemes at three different town centre locations in England. It examines the effect of the schemes on crime and disorder and helps to improve our understanding of how CCTV can be used to most effect to control crime and disorder within public places.

S W BOYS SMITH

*Deputy Under Secretary of State
Home Office, Police Department
November 1995*

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The Author

At the time of writing, Ben Brown was a member of the Home Office Police Research Group.

Executive Summary

Many local authorities throughout the country have installed or are planning to install closed circuit television (CCTV) systems within their town centre areas. Very few systematic evaluations of CCTV systems have been carried out and very little information exists about the way in which cameras can impact on crime within public spaces.

This project looks at how the police use CCTV systems to impact upon criminal and anti-social behaviour within a number of town centre areas. It also looks at the effect that camera systems can have on overall crime rates for different types of offence within different types of town centre area. In doing this, we may begin to understand the circumstances and conditions needed for CCTV to have the greatest impact on these types of behaviour.

Design of the study

The research consists of three case studies. Each of these case studies examines the effect of a camera system in very different sites around the country - Newcastle, Birmingham and King's Lynn. The research involved interviews with CCTV operators, police officers and local authority officials, and an examination of police crime/incident data and CCTV incident data.

How police use camera systems

The results show that the police *actively* use CCTV systems for gathering information. The cameras are used to patrol town centre areas and discover incidents as they occur. Just as police patrols can be directed to high crime locations, CCTV cameras can also be used very successfully to provide more discreet surveillance of these types of area. The information provided by the cameras is then used by the police to co-ordinate an appropriate response, and gather evidence that can be used to direct investigations and secure the swift conviction of offenders. The information provided by cameras can also save police resources by investigating 'false alarms' and showing that a police response is not required.

Cameras are most commonly used to tackle conspicuous anti-social and criminal behaviour. This behaviour mainly refers to public disorder problems which range from nuisance behaviour to assaults and woundings. However, in a significant minority of cases the camera systems have led to arrests for other offences such as burglary, car crime, robbery and murder.

Effect on crime

When cameras are first installed within an area, they can have strong deterrent effect on a wide range of crimes. This may explain the reductions in crime often indicated by short term evaluations of town centre schemes. However, the effect of cameras on crime may start to fade in the longer term. In order to sustain the effect of cameras on a particular offence, the cameras must be used to increase the risk of arrest for offenders.

Property crime

In all the areas included in the study there is evidence to suggest that the use of cameras has reduced property crime, especially **burglary**. This is most evident in Newcastle city centre, where the layout of the town centre is simple and the degree of camera coverage is high. Moreover this reduction in Newcastle has been achieved with no apparent displacement of offending to surrounding areas or different types of offence.

Personal crime

The effect of cameras on personal crime is less clear. In large metropolitan areas, the cameras have had very little effect on overall levels of assaults and wounding, despite being used to prompt many arrests. It is suggested, however, that the strengths of the camera systems in dealing with **assaults** lies less in preventing such offences (which it is argued will occur anyway because of their impulsive nature and the role of alcohol), but more in coordinating a quick response which may reduce the seriousness of an incident. The cameras also provide evidence to direct investigations and secure the swift convictions of offenders thereby reducing costs associated with the investigation and prosecution processes.

In Birmingham, where the layout of the city centre is complex and the degree of camera coverage relatively low, there was evidence to indicate that **robbery and theft from the person** had been controlled and even decreased in areas with good camera coverage. However, there was also evidence to indicate that offending may have been displaced to nearby areas within the town centre where there was partial or no camera coverage.

Effect on fear of crime

The Birmingham case study also looks at the impact of CCTV on the public's feelings of safety. The survey found that people *who were aware of the cameras* felt safe in the city centre streets after dark after the cameras were introduced. This effect was not found, however, for those people who regularly used the city centre at night (who were less fearful generally anyway) or for those people who were unaware of the cameras.

The implications of the study for good practice in the use of CCTV are:

- camera systems should be fully integrated into police command and control strategies, and be used to assist decisions concerning the deployment of officers and how best to coordinate a response to incidents;
- a high degree of camera coverage is required to be most effect in tackling crime. The use of pan/tilt/zoom cameras may help to achieve such coverage. Care should be taken over the location of cameras to ensure that their view is not blocked by trees and other obstacles;
- in relation to acquisitive personal crimes such as robbery and theft from the person within an area, care must be taken to ensure that these offences will not be displaced to neighbouring areas where coverage is not so good but similar opportunities for such crimes to take place exist;
- CCTV, and any successes in using it, should be well publicised both to help reduce fear of crime and to help deter offenders.

Contents

	Page
Foreword	(iii)
Acknowledgements	(iv)
Executive summary	(v)
List of figures	(x)
List of tables	(xii)
1. Introduction	1
2. Approach to this study	4
How might CCTV cameras reduce crime?	4
How the police use CCTV to affect crime	5
Other uses of CCTV	7
Publicity	8
Framework for evaluation of CCTV within town centres	8
Selection of sites for further study	10
3. Newcastle upon Tyne	11
The aims of the scheme	13
Operational procedures	13
How the system is used in Newcastle	14
The effect of CCTV on incidents in Newcastle	15
Effect of the system on arrests and investigation	23
Conclusions	26
4. Birmingham	27
The aims of the system	31
Operational procedures	31
How the system is used in Birmingham	31
The effect of CCTV on recorded crime in Birmingham city centre	33
Successful uses of CCTV	39
Survey of members of general public	41
Conclusions	45

	Page
5. King's Lynn	47
The aims of the scheme	50
Operational procedures	50
How the system is used in King's Lynn	51
The effect of the cameras on recorded crime in King's Lynn	56
Conclusions	60
6. Conclusions	62
The police use of town centre CCTV systems	62
The effect of cameras on offending within town centres	62
Public support for CCTV	66

References

Police Research Group papers

List of Figures

Figure No.	Caption	Page
1.	The streets in Newcastle are wide and relatively straight which makes them very suitable for camera surveillance	12
2.	The area covered by each camera is-considerable. The black dot in figure 1 represents the camera seen in this picture	12
3.	Although sonic streets are not covered by cameras (such as the one shown above), access to these streets is often covered	12
4.	Camera coverage within Newcastle Central command area	16
5.	Trends in the number of burglary incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions	19
6.	Trends in the number of criminal damage incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions	19
7.	Trends in the number of vehicle theft incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions	20
8.	Trends in the number of theft from vehicle incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions	21
9.	Trends in the number of juvenile disorder incidents, January 1991 - May 1994 for Newcastle and Northumbria police regions	22
10.	Trends in the number of other' theft incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions	22
11.	Camera coverage within Birmingham city centre	29
12.	This piece of street furniture is a considerable obstacle to the view of camera nine	30
13.	The trees to the right of the obstacle in figure 11, when in full leaf, are also considerable obstacles	30
14.	When in full leaf, the trees pictured here seriously affect the view of cameras 12 and 7	30
15.	Trends in recorded crime figures for robbery and theft from the person within Birmingham city centre, January 1990 - September 1993	34
16.	Trends in recorded crime figures for criminal damage within Birmingham city centre, January 1990 - September 1993	35
17.	Trends in recorded crime figures for wounding and assault within Birmingham city centre, January 1990 - September 1993	36
18.	Trends in recorded crime figures for theft of vehicles within Birmingham city centre, January 1990 - September 1993	37
Figure No.	Caption	Page

Contents

Figure No.	Caption	Page
19.	Trends in recorded crime figures for theft from vehicles within Birmingham city centre, January 1990 - September 1993	38
20.	Trends in recorded crime figures for burglary other within Birmingham city centre, January 1990 - September 1993	39
21.	The car park cameras in King's Lynn also cover the rear access to and rooftops of local shops and public houses	48
22.	Major vehicular thoroughfares are also covered by the car park cameras	48
23.	Two of King's Lynn's car parks also serve as market places. Note the camera can monitor activity outside surrounding buildings	48
24.	A common ground for drug users	48
25.	Incidents noticed by CCTV operators within King's Lynn, February 1992-September 1994	52
26.	Incidents brought to the attention of CCTV operators in King's Lynn by other agencies, February 1992 - September 1994	54
27.	Trends in recorded crime figures for theft from vehicles in King's Lynn and surrounding areas, February 1991 - October 1993	56
28.	Trends in recorded crime figures for theft of vehicles in King's Lynn and surrounding areas, February 1991 - October 1993	57
29.	Trends in recorded crime figures for burglary in King's Lynn and surrounding areas, February 1991 - October 1993	58
30.	Trends in recorded crime figures for criminal damage for King's Lynn and surrounding areas, February 1991 - October 1993	58
31.	Trends in recorded crime figures for woundings and assaults in King's Lynn and surrounding areas, February 1991 - October 1993	59

List Of Tables

Table No.	Caption	Page
1.	Areas selected for detailed study and the type of data collected	10
2.	Average monthly totals for incidents before and after the cameras became fully operational	17
3.	Average monthly arrest rates for Newcastle Central before and after the installation of cameras	23
4.	Police use of CCTV within Birmingham city centre during 1994	40
5.	Incidents experienced in Division F in a one year period before and after the installation of CCTV	42
6.	Feelings of safety in Birmingham city streets after dark	43
7.	Differences in responses between night and day respondents	44
8.	Arrests resulting from the use of CCTV within King's Lynn	53

1. Introduction

Closed circuit television (CCTV) cameras are becoming a very common feature of public life. They can be found in shopping facilities, town centre streets, banks, building societies, car parks, schools and colleges, transport facilities and housing estates. The presence of CCTV cameras within shopping centres is very common. Centre managers often install cameras as part of an overall management package which deals with a range of activities, including criminal and anti-social behaviour. In an attempt to match the standards set by shopping centres, many local authorities have installed or are planning to install CCTV cameras in their town centre streets. A recent estimate indicated that over 200 areas across the country, ranging from metropolitan cities to small market towns, have installed or are planning CCTV systems (Clarke 1994).

Despite early fears concerning civil liberties, the general public, at the moment, does not appear to be concerned about the proliferation of such schemes within the public domain. As Edwards and Tilley (1994) point out, research conducted for the Home Office in 1992 showed that very few people - 6% of respondents - were worried about the presence of CCTV cameras.

The success of cameras in reducing overall crime levels within different locations, however, has rarely been assessed (or indeed questioned). In their recent survey of retailers carried out on behalf of the British Retail Consortium, Speed *et al* (1995) found that this lack of empirical evidence for the effect of cameras on overall crime levels might be starting to cause some concern. Although retailers have contributed considerable sums of money to support public CCTV schemes, they remain unconvinced about the effectiveness of cameras (for example on apprehension for theft). They also do not believe that public area CCTV schemes have increased either turnover or profits. The lack of empirical evidence for the effect of CCTV, therefore, may affect the willingness of retailers to fund such schemes in the future.

There are a few small scale evaluations that have attempted to assess the impact of security cameras on crime and disorderly behaviour within different locations. Van Straelen (1978) claimed that the installation of CCTV cameras in a large French supermarket had reduced losses by 33 percent. More recently Tesco launched an internally-developed security package known as the 'Totally Integrated Security System' (TISS) to tackle losses incurred at their stores. Although TISS involved changes in store design and procedure, its main component was the provision of CCTV which allowed the monitoring of all vulnerable areas both within and outside the store. When TISS was first introduced into an existing 'problem' supermarket, unknown losses dropped from some £12,000 a week to £5,000 a week (Burrows, 1991). In addition cash

INTRODUCTION

losses from tills dropped considerably and violent incidents almost disappeared. This indicated that when CCTV was installed within a shop as part of an integrated security package, it deterred crime within this environment. There were also other benefits in that:

...the 'quality' of arrests of more professional thieves is improved and that taped evidence increases the likelihood of "guilty" pleas in the courts. (Page 9, Burrows 1991).

In 1985, a bus company in the North East of England launched a security programme aimed at deterring vandalism on buses (Poyner 1992). Initially, one bus was equipped with a CCTV camera on the upper deck. In the first month of operation, this camera filmed a number of incidents involving damage caused to the upper deck of the bus. The bus company, with the assistance of a local school, soon identified the perpetrators and took action against them. The success of the video bus was well publicised in the local media. Staff from the bus company visited schools and demonstrated the effectiveness of the system by filming pupils on the top deck of buses and then showing them the tapes. More buses were then equipped with video equipment and incidents of vandalism decreased further.

CCTV cameras can also reduce crime in car parks. Poyner (1992a) showed that when security staff at the University of Surrey installed CCTV cameras in their car parks, car crime (especially theft from vehicles) declined. The author suggests that this effect was because the system had been used to arrest and take action against offenders and that these successes were publicised in the local press. It is important to note that other improvements were made to the car parks at the same time: the lighting was improved and bushes were pruned in order to improve the opportunities for surveillance.

Tilley (1993), in possibly the most thorough evaluation of the effect of CCTV on crime to date, also found that the presence of CCTV cameras within car parks could reduce car crime. He too remarked that:

The effect of CCTV appears to be enhanced when it is installed alongside other complementary measures, raising its credibility as a source of increased risk to the offenders. (Page 23, Tilley 1993).

However, he also discovered that the systems did not have to be technically sophisticated or monitored continuously to have an impact on car crime in car parks. Since he found that very few arrests took place in the car parks included in the study, he concluded that the:

... removal of offenders does not constitute the mechanism through which CCTV currently reduces car crime. (Page 23, Tilley 1993).

This failure to apprehend offenders might have affected the long term effectiveness of some of the camera systems evaluated by Tilley. In some cases the cameras became less effective at deterring crime as time passed, an effect that is common to many crime prevention efforts. Regular publicity concerning the role of the cameras in apprehending suspects was recommended to maintain the perceived effectiveness of the system amongst offenders.

Both Webb and Laycock (1992) and Mayhew *et al* (1979) found that installing CCTV cameras as part of general security package at selected London Underground stations had reduced the number of robberies within these premises. Consistent with Tilley, Webb and Laycock found that after 12 months the effect of the project began to wear off, possibly because offenders realised that the risk of being caught had not increased. Mayhew *et al* also found that the number of thefts from the person had declined, but their data indicated that these offences might have been displaced to neighbouring stations.

One of the main arguments against the effectiveness of cameras is that they simply displace rather than deter or prevent crime. Evidence indicates, however, that cameras within some locations may in fact lead to a 'diffusion of benefits'. For example Poyner (1992, 1992a) found that the presence of cameras within one location had a beneficial effect on the number of offences within another, unprotected location. When cameras were introduced to reduce vandalism on buses, reductions in the incidence of vandalism occurred on all buses and not just those which had cameras. When cameras were installed at University of Surrey parking facilities, car crime decreased not only in the car parks that were covered by cameras, but also a nearby car park where there was no camera coverage.

The aim of this study is to look at how the police and other agencies use CCTV systems to tackle crime and disorderly behaviour within town centre streets. Although CCTV is also used in town centres to supervise internal and external private areas such as inside shops and in shopping malls, the focus of this report is on schemes that cover external public town centre streets. The study also looks at the effect of installing cameras on the number of incidents that occur within the town centre and surrounding areas. In doing this, we may begin to understand the circumstances and conditions that are needed for CCTV to have the greatest impact on these types of behaviour.

APPROACH

2. Approach to this study

The method used in this study draws heavily on the 'scientific realist' approach advocated by Pawson and Tilley (1994). This approach focuses on the particular mechanisms through which crime prevention measures impact on criminal behaviour, and the particular context in which they might be expected to work. Scientific realism insists that:

... the outcomes unearthed in empirical investigation are intelligible only if we understand the underlying *mechanisms* which give rise to them and the *contexts* which sustain them. In evaluation language, this is equivalent to saying that we need to know why and in what circumstances programmes affect potential subjects *before* we can begin to say if they 'work'.... Scientific realism [therefore] starts with a *theory* of what makes programmes work and a *theory* of the circumstances in which such ideas are likely to be efficacious. (Page 292, Pawson and Tilley 1994).

According to this approach, therefore, the first step in any evaluation is to formulate a theoretical basis as to how CCTV may be affecting crime in a given context.

How might CCTV cameras reduce crime?

Installing CCTV cameras to tackle criminal and disorderly behaviour is an example of what Brantingham and Faust (1976) refer to as primary crime prevention, and what Clarke (1992) refers to as situational crime prevention. The theoretical approach to this type of crime prevention refers to the reduction of criminal opportunities, and so

... has turned to theories of the crime *event* rather than the motivated offender, for its inspiration. (Page 662, Pease 1994, italics added).

Cohen and Felson (1979) in their routine activities theory state that for an offence to occur three elements must converge in time and space during the course of people carrying out their routine activities. These are a motivated offender, a suitable victim and the absence of a capable guardian. As Tilley (1993) points out, it is possible that the presence of CCTV cameras may deter crime by impinging on any one of these elements. For example, the presence of cameras may remove the motivated offender by increasing the perceived risk. Alternatively, the cameras may allow the police and/or other security agencies to respond more quickly to an offence therefore introducing the presence of a capable guardian. Another possible alternative is that the presence of CCTV cameras may remove suitable victims by making potential

victims more security conscious and therefore less vulnerable to crime. However, the lack of empirical evidence means that it is impossible to say which of these three elements is affected by the presence of CCTV cameras within an area.

A complementary theoretical approach is provided by the rational choice theory of Clarke and Cornish (1985). This suggests that offenders are involved with making decisions and choices, and these choices exhibit a measure of rationality. The focus of this approach is on both the offender and the immediate situational context of crime. Installing CCTV cameras within an area increases the opportunities for surveillance and thus the risk associated with offending. Offenders would be deterred by cameras only if they interfered in some way with the likelihood of offenders benefitting from this behaviour within that particular context. In Felson's language, this is equivalent to de-motivating the offender.

Different groups of people may have different ideas about how CCTV might affect criminal behaviour. As part of their research into the acceptability and perceived effectiveness of CCTV, Honess and Charman (1992) found that the public believed that the main purpose of camera systems was to help with the detection and investigation of crime. Honess and Charman also asked the managers of various different types of schemes (such as car park, shopping centre and town centre schemes) what they perceived the use of the camera systems to be. For managers, crime prevention rather than detection was the dominant aim of CCTV.

How the police use CCTV to affect crime

In order to establish how the police are using or claim to be using CCTV to tackle criminal behaviour, initial visits were made to eight different town centres where CCTV cameras had been installed. These visits involved talking to local police officers, CCTV camera operators and local authority officials.

The police tend to use CCTV within town centres for a wide variety of purposes including both crime prevention and detection. In the first instance, the cameras help to control crime by serving as part of a communication and information gathering network. These networks may also include radio links, pager systems and/or direct phone links between camera operators, staff in the police control room and other security staff who work in the town centre.

APPROACH

Information can pass from the different parties in the network in a number of ways. For most systems, the camera operators have links to police officers on the ground via the police control room. The operators spend most of their time 'patrolling' the areas under surveillance, passing information to police control room staff about incidents which they feel might require a police response. It is often the case that an additional remote monitor is situated in the police control room. When staff in the control room have been alerted to an incident, they can then look at the incident displayed on the remote monitor and use the information to coordinate an appropriate response.

Control room staff will also routinely receive reports about incidents taking place within sight of the cameras from other sources such as patrolling officers and members of the public. In areas where there is a radio or pager link, traders and store detectives can also pass information concerning incidents or suspicious persons directly to camera operators and the police. The camera operators can then adjust, or be requested to adjust the positioning of the cameras accordingly so that control room staff can coordinate a suitable response.

Once an incident has been noticed, the system can then be used as a tool to gather evidence. Forces with access to camera systems have numerous video tape recordings that show how the systems have been used for this purpose. A typical example might show an offender in the process of committing an offence. Having noticed the incident, the operator passes the details to the police using the telephone/radio link. The police control room staff coordinate a response to the incident using the information on the remote monitor as an aid and this response is also filmed. In such cases the system not only provides information to help coordinate a response but also captures evidence that can be used to secure a swift conviction. The whole incident from the point the offender begins to commit an offence to the point when he is arrested is caught on film. This leaves him with little choice but to admit guilt of the offence with which he is charged.

Many cases are not as straightforward as this scenario suggests. For example, offenders can often conceal themselves in a large group of people. Officers arriving at the scene then have difficulty deciding whom to take action against. In such cases, the camera operators can help to identify the guilty parties, reducing the chances of and costs associated with wrongful arrest. In addition, offenders may attempt to escape from the scene of an offence or hide behind nearby obstacles. Camera operators, however, can monitor the offender's movements and pass through this information to officers in pursuit.

Tape recordings are also used in helping with the investigation of offences that failed to be noticed by operators. In these cases, the camera images are likely to have been recorded in time lapse mode, ie. only one in a specified number of frames will be recorded thus extending the information that a tape can record (if an operator notices an incident the video should switch to real time recording). Because images also carry information about the time, date and location, officers can request tapes that contain images about certain areas at certain times. It may turn out that the tape contains a recording of the offence. What is more common, however, is that officers use the information to identify potential witnesses. A good example of this is how the police used filmed evidence to investigate the abduction and murder of Jamie Bulger.

The cameras can also be used proactively to prevent problems from arising in the first place. Many cameras have what are known as 'home positions' which are locations on which the cameras will automatically focus when not being moved by the operator. The locations will be places where the likelihood of incidents occurring is higher than average, or where there is a potential for serious crimes to take place. Such locations typically include the exits/entrances of troublesome public houses or nightclubs, bus stations, food takeaways and banking premises.

The police also make use of CCTV systems during specific operations which are set up to deal with specific types of crime. For example, tracking and collecting evidence of the movements of organised shoplifting 'teams' and co-ordinating drugs raids on premises.

Other uses of CCTV

Public order and security operations can also benefit from the information gathered by CCTV cameras. In these situations, the systems are particularly useful in helping with the planning and command of police resources. This can reduce the opportunities for disorder and increase the safety of the general public at such events. Some commanding officers have reported using the cameras to help with the evacuation of an area in response to a bomb threat. In a number of sites visited, the cameras are used to monitor the movements of large groups of football fans making their way to or from local football stadia. It is claimed that CCTV can also benefit the safety of officers in public disorder situations because it can help ensure that the police response is adequate for any particular situation. For example, if there is a large group of people fighting then the controllers know not to send a single officer. On the other hand, in order to avoid escalating an incident, controllers know not to send a van to a minor dispute, since a heavy police response might inflame a situation.

APPROACH

The CCTV system can be used to monitor these incidents remotely so that the police can maintain a low level presence. As a consequence, some supervisors claim that by installing cameras the number of assaults on officers has been reduced.

According to the police and operators, there are endless and sometimes unexpected uses for CCTV systems other than dealing with crime and disorder. Most of these are connected with the general efficient management of a town centre, for example monitoring of traffic flow and dealing with traffic congestion, arranging for obstacles to be moved and ensuring that the centre is kept tidy.

Publicity

It is well documented that the publicity generated by the launch of high profile crime-prevention initiatives can affect crime rates (Stockdale & Gresham, 1995; Berry and Carter, 1992; Laycock, 1985). The police forces involved in this research stated that they actively forged relationships with the local and in some cases national media to promote the perceived effectiveness of their CCTV schemes. Not only did they seek a high profile launch but they also highlighted the subsequent successes of their schemes through publicising dramatic falls in crime rates for areas coerced by CCTV (although to date no detailed evaluation of any scheme has been completed). Recent examples of the benefit of CCTV in particular cases have also been well reported in the national press (for example the abduction of Jamie Bulger, the Harrods bombers and the kidnapping of 'baby Abbie' by Julie Kelley).

Framework for evaluation of CCTV within town centres

It follows from the preceding discussions that CCTV cameras can help the police to tackle crime and disorder by improving capable guardianship and increasing the risks associated with offending. This increase in risk reduces the suitability of the target and de-motivates the offender. Specifically the cameras increase capable guardianship by acting as:

- an aid to deployment - camera operators can 'patrol' city centres effectively and efficiently, and because of the carefully selected siting of the cameras, will gain an excellent view of incidents as they start to occur. They can also carry out the surveillance of an area in response to a request for assistance and are in a unique position to help with the co-ordination of an effective and rapid police response to an incident;

- an aid to the identification and arrest of suspects - if offenders attempt to flee from the scene of an offence or hide behind obstacles or conceal themselves in large groups of people, the operators are able to monitor their movements and pass this information to officers on the ground;
- a deterrent to criminal/offensive behaviour - the very presence of cameras and the publicity generated by schemes may act as a deterrence for offenders. In addition, as potential offenders start to realise the effectiveness of the systems, they will be deterred from committing offences;
- an evidence gathering tool - the cameras are not only used to film incidents as they occur but are also used to film the police response. A suspect, if guilty, may have little choice but to admit to the offence. Tape recordings of areas also help officers to locate witnesses who may be able to help police officers with their enquiries. Swift deployment to scenes may also assist in the assembly of evidence since witnesses may still be present as well as, possibly, the suspect.

The presence of CCTV cameras may have a different impact within different environments and affect different crimes in different ways. For example, Honess and Charman (1992) reported that the public felt that cameras would have little effect on offences such as (drunken) disorderliness and rowdy behaviour, because 'they will do it anyway'. In their examination of the use of CCTV in London Underground stations, Webb and Laycock (1991) found that CCTV was less successful in controlling crime at large, labyrinthine stations such as Oxford Circus than at smaller, less complex stations such as those at the southern end of the Northern line. They concluded that:

CCTV does not seem very useful in large, complex and crowded environments to deal with more surreptitious behaviour such as pickpocketing or shoplifting. However, CCTV has been successfully used to reduce breaking into cars in an open car park (Poyner and Webb, 1987) and damage to top decks of buses (Poyner, 1988). These are more conspicuous behaviours and the environments are more easily supervised, so that offenders were either caught red-handed or tracked down later because they were wearing a distinctive school uniform. (Page 23, Webb and Laycock, 1992).

The effect of cameras on different types of crime therefore may depend on two factors. First the nature of the area under surveillance (large and complex vs small and simple layout). Secondly, the nature of the offence, i.e. whether or

APPROACH

not the crime is committed surreptitiously, and the extent to which an offence is either impulsive (as with rowdy behaviour) or planned as with the robbery of a bank for example. The presence of cameras might be expected to have most effect within confined areas, or within those areas where camera coverage is extensive and on those offences that are planned and relatively conspicuous.

Selection of sites for further study

A study of local authorities areas carried Out by the Urban and Economic Development Group in 1994 identified five different types of town centre: market towns, industrial towns, suburban centres, metropolitan cities and historic/resort towns (URBED, 1994). Three of the eight schemes initially visited were selected for detailed evaluation. Table 1 shows the different types of town centre included in the sample and how they relate to the URBED classification. These three sites also reflect the various operational procedures used by town centre CCTV schemes, with the Newcastle and Birmingham systems being operated from police premises by police officers and civilian staff, and the Kings Lynn system being operated by private security staff from local authority premises.

This study is typical of many thematic evaluations in that it was designed to use data that already existed within participating police forces and local authorities. The exact nature of the data collected varied from scheme to scheme. Table 1 also shows the type of data collected from the different schemes.

Location	Environment	DATA COLLECTED				
		Crime / incident data	Arrests	Observation	Public Survey	CCTV incident data
Newcastle	Metropolitan city centre (simple layout)	✓	✓	✓	-	✓
Birmingham	Metropolitan city centre (complex layout)	✓	-	✓	✓	✓
King's Lynn	Market town / Historical	✓	-	✓	-	✓

3. Newcastle upon Tyne

Newcastle upon Tyne is a large provincial city situated on the mouth of the River Tyne in north east England. The city centre is typical of large English metropolitan city centres, if a little more compact. The area has a low resident population but has many public houses, night clubs, restaurants, shops and offices. It also plays host to a number of major events, including royal visits. In addition, St James's Park, the football ground for premier league Newcastle United is situated near to the centre. The city centre, therefore, attracts large numbers of people and vehicles, and the police officers working here face a number of problems, including those associated with public order, personal safety, property crime, traffic congestion and terrorism.

To help the local commander deal with these problems, a 16 camera monochrome CCTV system was installed in December 1992. All the cameras have a pan, tilt and zoom function. Images from these cameras are transmitted by microwave to four monochrome monitors which are located in the front desk area of the local police station. Two of these monitors are split screen and two are single image. The system records images in time lapse mode but operators can switch to real time recording if required. Attached to the monitors is a facility for producing hard copies of images which are used to provide additional evidence for prosecutions.

The initial funding for the system came from the City Centre Partnership Security Initiative, a corporate initiative set up using a grant from the Department of the Environment and funds from the local private sector. Northumbria Police Authority is responsible for paying the on-going maintenance cost and that of the salaries and costs relating to the civilian operators who monitor the system.

Camera positions were selected using crime pattern analysis. The area covered by the cameras contains a number of major vehicular thoroughfares, is partly pedestrianised and is made up of shops, commercial and financial properties, and an extremely high number of licensed premises. There is also a large covered shopping mall within the Newcastle city centre - Eldon Square - which has its own privately operated camera system.

As an area, Newcastle city centre is very conducive to camera surveillance. The streets are wide and relatively straight; there are few subways and few obstacles which block the view of the cameras (see figure 1). The area covered by each camera is considerable and overlaps with those areas covered by neighbouring cameras (see figure 2). Very few streets within the city centre do

not have some form of camera coverage (see figure 3). Most vulnerable premises are located in the streets that have full camera coverage.

Figure 1 The streets in Newcastle are wide and relatively straight which makes them very suitable for camera surveillance



Figure 2 The area covered by each camera is considerable. The black dot in figure 1 represents the camera seen in this picture



Figure 3 Although some streets are not covered by cameras (such as the one shown above), access to these streets is often covered



The aims of the scheme

The main aim of the system is to support the operational policing of the city centre area. The system is therefore used as part of a wider policing package to tackle burglary (including ram-raiding), public disorder, theft from the person, robbery, the selling and using of drugs, traffic congestion, security and terrorism. In general terms:

The purpose of the use of the CCTV to monitor public places, by a police approved system is to assist with the prevention and detection of crime. Closed circuit television will also assist greatly in the maintenance of public order, reducing nuisance and vandalism offences and enhancing a sense of safety by members of the general public. (Use of closed circuit television system, codes of practice for Newcastle city centre, paragraph 2.1).

Operational procedures

The system is controlled entirely by the police. All monitors are located within the front desk office in the police station. The team of police officers and civilian staff who work in the office are responsible for monitoring the cameras 24 hours a day. They work on exactly the same shift system as the operational officers and so form part of a wider operational policing team. Although there is always one member of staff who is designated as the CCTV operator working at any one time within the front office, any member of the front desk team can and does operate the camera system. This ensures that the system is monitored constantly and helps to reduce fatigue in the operators. Each member of staff receives on the job training in operating the cameras, and a new member of staff will sit with a more experienced operator until he/she learns the basics of the system.

When the scheme was first launched, it had a radio/phone link to the central area operations room at Byker. However, the staff who monitor the system now have their own personal radios which they can use to communicate directly with officers on the beat. The operators believe that this is a great improvement because it provides the facility for immediate communication. This allows them to co-ordinate a much quicker response to an incident. There is also a separate radio link to local retailers and to the operators of the privately owned and monitored system in the Eldon Square shopping centre.

How the system is used in Newcastle

The operators use the cameras to 'patrol' the city centre, in much the same way as would an operational officer: they search for suspicious incidents, monitor potentially difficult situations as they happen and keep an eye on the local 'characters'. They know that there are more likely to be problems in certain areas at certain times. During the day, they tend to concentrate on monitoring the busy shopping areas whereas during the evening and night they tend to concentrate on those areas where the majority of the pubs and nightclubs are located. They also know that certain areas are associated with different types of crime. Licensed premises within a particular street, for instance tend to be the location of many public order problems; a park area is often used by certain members of the public to roll and smoke cannabis cigarettes; there is also a certain area where children and youths tend to congregate which leads to problems of criminal damage. Even more organised criminal activity may be linked with a particular location and these problems can be tackled with the help of the camera system (see case study 1).

Case study 1

Prior to the installation of the cameras, there was a particular area within Newcastle city centre where people were selling stolen goods. The police made a number of attempts to clamp down on this activity, but they were only successful in disrupting temporarily. It soon became very difficult for officers to carry out undercover surveillance as the traders recognised the officers by sight. When the cameras were installed however, they were used to carry out discreet surveillance of the area. The cameras allowed the police to gain excellent information about the activities of the traders. This information was used to co-ordinate timely and effective action against the traders. The problem has since ceased.

The operators also make use of the local intelligence information. This may include keeping an eye out for wanted persons. Intelligence reports may also indicate that a certain area may be suffering from a spate of certain types of offences. The camera operators can then be on the look out within these areas for these types of offences. The police can also use the cameras for gathering evidence as part of organised surveillance operations (see case study 2).

Case study 2

The regional crime squad were investigating a gang whose modus operandi was to steal goods from parked lorries. They had acquired intelligence that the gang were targeting lorries parked within a particular area within Newcastle city centre. For seven days the CCTV operators used the system to film the gang coming and going with stolen goods taken from lorries parked in this area. This filmed evidence played a crucial role in convicting the offenders.

The effect of CCTV on incidents in Newcastle

The police in Northumbria made available final incident code data from a number of areas which allowed an assessment of the effect of installing the cameras in Newcastle City Centre. Final incident code data refer to incidents that the police have responded to and then assigned a code to. They are therefore similar to recorded crime data and might be more accurate as not all reported crime is represented in recorded crime statistics.

The data examined in the study relate to 20 different types of incident which took place in the following areas:

CCTV area - this is made up of beats B2, B3, B4 and B7 of the Newcastle Central Area (see figure 4). These beats cover the shopping, business and financial areas of the city centre. Fourteen of the 16 cameras installed in the city centre are located within these beats. The coverage of this area is very extensive and is integrated, i.e the field of view for each camera overlaps.

No CCTV area - this is made up of the seven remaining beats of the Newcastle Central area which surround the central CCTV area. The area mainly consists of the two universities and the riverside district. St James's Park (the football ground of Newcastle United FC) is also located within this area. Only 2 of the 16 cameras are located within these beats.

Byker (Newcastle East) - this is one of Newcastle Central's neighbouring divisions and consists mainly of residential housing. There are no cameras in this area.

Force - Figures for all other divisions within the Northumbria force were collated and used to provide an additional control measure.

Figure 4 Camera coverage within Newcastle Central command area. The round marks represent camera positions and the dotted lines represent beat boundaries.



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Table 2 shows the average monthly totals for the 26 months before the cameras became fully operational in March 1993 and for the 15 months following this date. Only those offences which show significant decreases *or* increases have been included in this table.

Table 2. Average monthly totals and percentage changes for incidents before and after the cameras became fully operational									
	CCTV		NO CCTV		BYKER		FORCE		
	Pre CC TV	Post CC TV	Pre CC TV	Post CC TV	Pre CC TV	Post CC TV	Pre CC TV	Post CC TV	
Burglary	40	17	75	46	110	107	2307	2260	
		-57%		-39%		-3%		-2%	
Criminal Damage	32	21	111	83	217	225	4107	4441	
		-34%		-25%		+4%		+8%	
Theft/TWOC M/V	17	9	168	100	141	122	2590	2298	
		(-47%)		-40%		-13%		-11%	
Theft From M/V	18	9	106	65	110	98	2146	1803	
		(-50%)		-39%		-11%		-16%	
Theft Other	223	198	197	161	153	154	2437	2233	
		-11%		18%		+1%		-8%	
Juvenile Disorder	13	15	19	20	158	204	2601	3185	
		(+15%)		(+5%)		+29%		+22%	

1. Figures in bold indicate a significant difference in the incidence of offences, $p < 0.05$.
2. Where the base figure is low (i.e. less than 20), the percentages are expressed in brackets.

The most marked difference between averages is for burglary. Although there is no change in the number of burglary incidents in Byker and the rest of the force, the numbers of such incidents in both the CCTV area and non CCTV area of the Newcastle Central division have dropped significantly. The greatest reduction is within the CCTV area where there has been a 56 percent drop in the average monthly figure for burglary incidents. There has also been a similar pattern in the number of criminal damage incidents. Within Byker and the rest of the force the number of criminal damage incidents rose but in the two central divisions it fell significantly. Once again the greatest reduction of 34 percent occurred within the CCTV area.

The numbers of vehicle crime incidents have-dropped in all the areas. The most marked reduction however is within the CCTV area where the average monthly numbers of incidents for both theft of and theft from vehicles have almost halved, although it is important to note that the numbers for these incidents are small. 'Other' thefts¹ also fell significantly in the central division, but in this case the greatest reduction of 18 percent occurred in the no CCTV area. Finally, there is some evidence for an effect on juvenile disorder. Although there was no reduction in the numbers of these incidents for the central division areas, there were significant increases in Byker and the rest of the force.

By plotting the monthly figures for these offences we can obtain a better idea as to how CCTV has affected these types of incident. Each of the following charts displays indices for the respective areas. This means that each month's figures are represented as a percentage of the base figure, which for these charts is the number of incidents that occurred during January 1991. To make the comparisons clearer, quarterly moving averages of the monthly indices have been presented.

Figures 5 and 6 refer to burglary and criminal damage respectively. The figures show that for the CCTV area, the no CCTV area and Byker, the numbers of burglary and criminal damage incidents were all declining before the cameras were installed. After the cameras were installed, the rate for these incidents fell dramatically within the CCTV area. There have also been reductions in the no CCTV areas, but these reduction are more gradual, especially in the case of burglary. It is particularly interesting to note that the fall within the CCTV area occurred after the cameras were installed but before they became fully operational. This suggests that in the first instance the presence of cameras was deterring crime. Unlike many other crime prevention initiatives, however,

¹'Other' thefts refer to all thefts other than those from the person and those from vehicles. Mainly this will refer to theft from shops and stalls, but also refers to property that has disappeared and is assumed stolen.

the effect has been sustained which suggests that further action has consolidated and continued the initial effect.

Figure 5 Trends in the number of burglary incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions

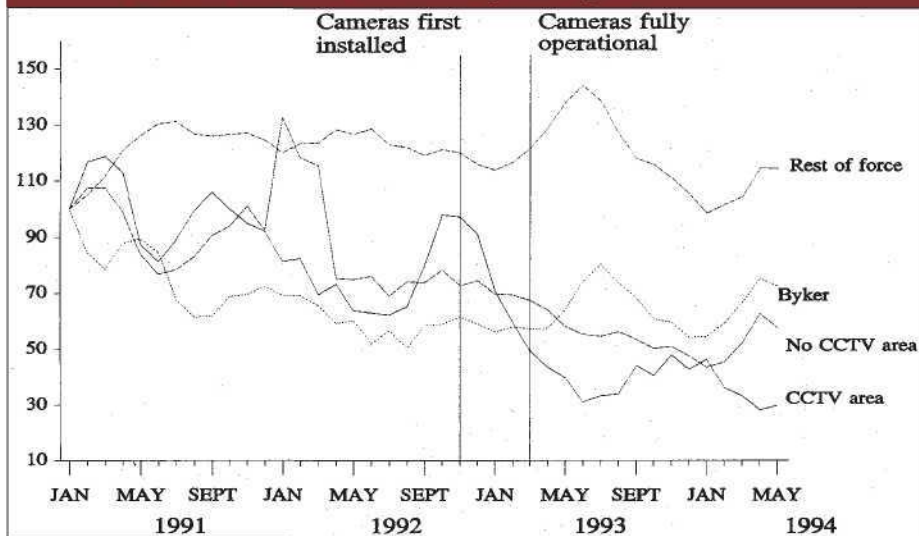
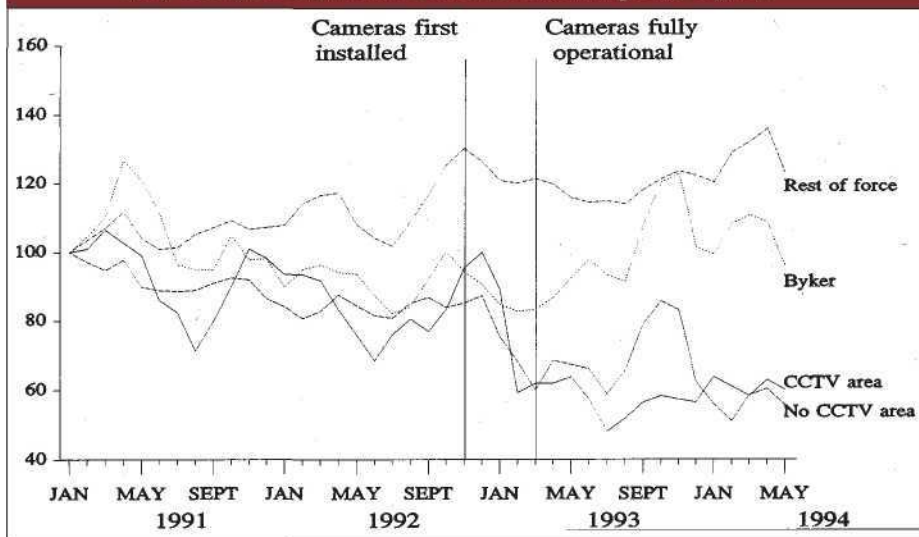


Figure 6 Trends in the number of criminal damage incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions



NEWCASTLE UPON TYNE

The effect of the cameras on vehicle crime is harder to discern (see figures 7 and 8). Thefts of and from vehicles were declining to some extent in the CCTV area, the no CCTV area and the Byker division prior to installation of the cameras. After the cameras were installed, thefts of vehicles have continued to decline sharply within the whole of the central division whereas the vehicle theft rate for Byker seems to have stabilised. In the CCTV area, however, this effect appears to fade after 8 months and the number of thefts of vehicles rises sharply. After September 1993 the trend for the CCTV area becomes similar to that in other areas.

There is a similar but weaker pattern for thefts from vehicles. The only difference is that within the CCTV area, the operationalisation of the camera system seems to have affected theft of vehicles while for thefts from vehicles, the main drop occurred between installation and the cameras becoming fully operational. Since the cameras became fully operational, thefts from vehicles have slowly increased within the CCTV area. It is important to note, however, that since the cameras were first installed, the central zone as a whole has performed relatively well with regard to vehicle crime when compared to Byker and the rest of the force.

Figure 7 Trends in the number of vehicle theft incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions

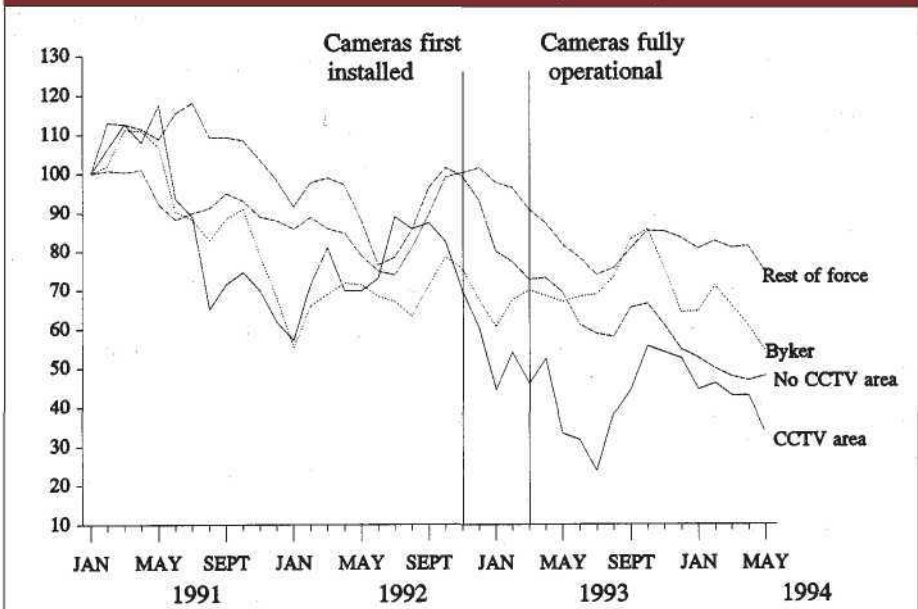
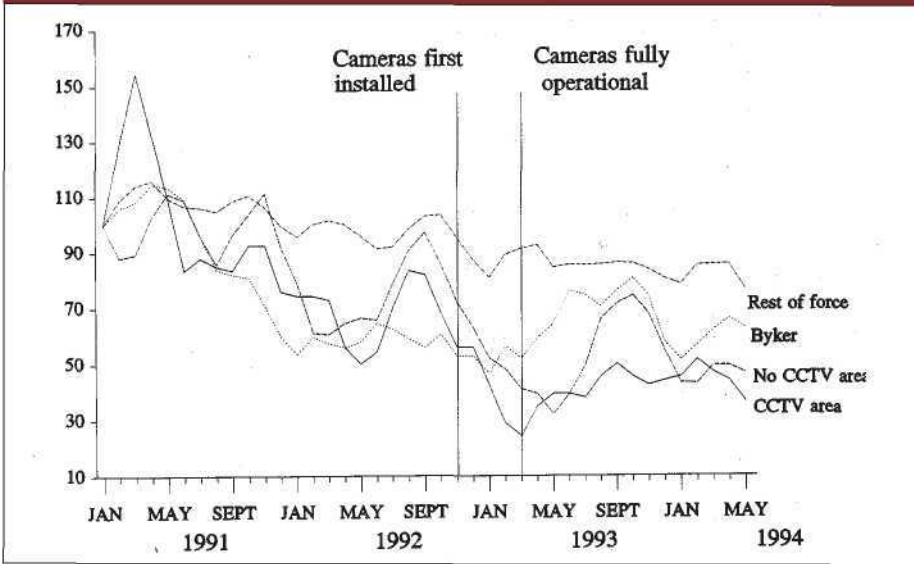
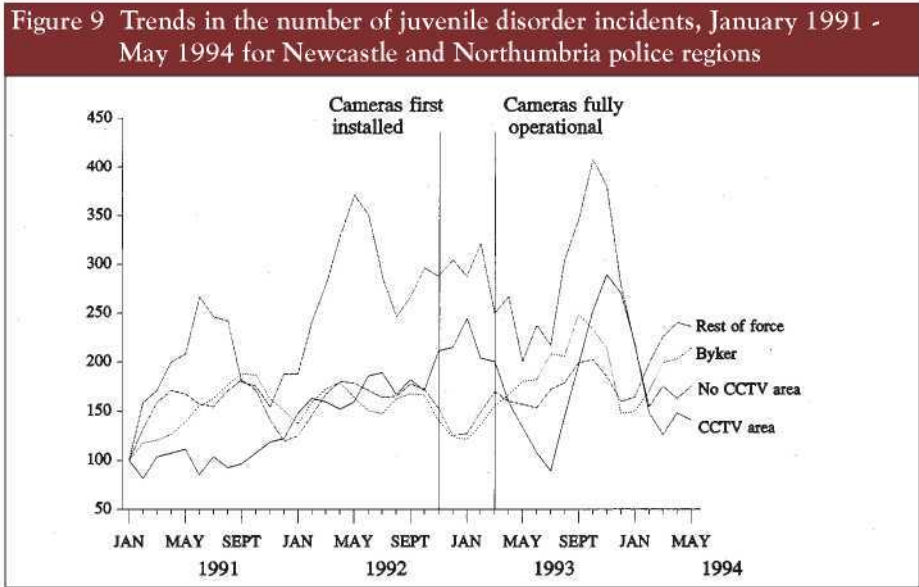


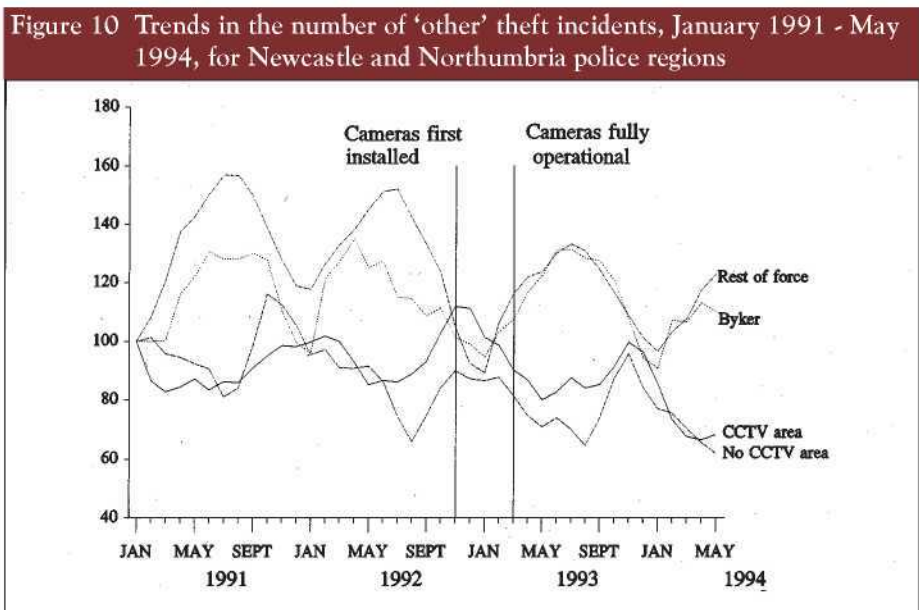
Figure 8 Trends in the number of theft from vehicle incidents, January 1991 - May 1994, for Newcastle and Northumbria police regions



The effect of cameras on juvenile disorder incidents and 'other' thefts is also more difficult to discern when compared with burglary (see figures 9 and 10). incidents of juvenile disorder were increasing sharply in the CCTV and no CCTV areas of the central division prior to installation of the cameras. Such an increase is not evident in the figures for Byker, or indeed the rest of the force. When the cameras became fully operational, juvenile disorder incidents fell very sharply in the CCTV area, and despite a sharp increase in such incidents prior to Christmas 1993, the figures have continued to fall. During the same period, there have been gradual increases in the numbers of this type of incident within Byker and the rest of the force. There has also been a sharp decrease in juvenile disorder in the no CCTV area, but the reduction does not coincide very well with either the installation or operational use of the cameras.



Other thefts also appear to have decreased in the CCTV area since the installation of cameras despite a rise in the number of offences prior to Christmas 1993. However, evidence for the effect of cameras is weaker.



Effect of the system on arrests and investigation

In order to look in more detail at how the cameras may be affecting crime rates within the Newcastle Central area, figures concerning arrest rates were made available to the researchers. Unfortunately these figures were only available on a divisional basis and could not be broken down into the CCTV and no CCTV areas. Moreover, there were no directly comparable categories for 'other' thefts and juvenile disorder. However they can be used to give some indication as to whether or not the camera system is helping to improve the arrest rate for some types of offence.

Table 3 shows that the average monthly number of arrests for both burglary and criminal damage have fallen since the cameras became fully operational. In both cases, however, the reduction in the arrest rate is considerably lower than the decrease in the number of incidents. This means, therefore, that for burglary and criminal damage the risk of arrest has *increased* since the cameras were installed within the central division.

For theft of and from vehicles, arrests and incidents have dropped by similar amounts, which indicates that the risk of arrest for these offences has remained more or less stable. It is interesting to note that the number of arrests for drunken offences has increased sharply despite a small drop in the number of incidents. This means that the risk of arrest for drunken offences has increased considerably since the installation of the cameras.

Table 3. Average monthly arrest rates for Newcastle Central before and after the installation of cameras

	Average monthly number of arrests			Number of arrests per 100 incidents	
	Pre CCTV	Post CCTV	% change in arrests	Pre CCTV	Post CCTV
Burglary	24	18	-25%	21	28
Criminal Damage	22	21	-4%	16	20
Theft of Vehicles	22	14	-36%	12	13
Theft From Vehicles	8	5	(-37%)	7	6
Drunken offences	101	127	+26%	65	85

1. Where base figure is low, (i.e. less than 20), percentage changes are in brackets

The personal experience of one of the five current camera operators supports these data. Between March and November 1994, this operator was directly responsible for just over 100 arrests. Almost half of these arrests were for drunken offences, public order offences or assault offences. This shows how useful the cameras can be in controlling disorderly behaviour, especially that fuelled by alcohol.

It is important to bear in mind that public disorder and assault incidents within town centres can have very serious consequences. In late 1994, the operator noticed and alerted police officers to an arrest which subsequently became a murder investigation (see case study 3).

Case study 3

Just after 11.00 pm one Sunday evening the CCTV operator noticed a person lying in the street. He looked around the area and then noticed two people who appeared to be attacking members of the public indiscriminately. One of the assailants then walked up to another person at a bus stop and hit him. The victim fell over and, as he fell he smacked his head on the curb. At this moment a bus drew up. The assailants then got on bus, but by this time the CCTV operator had alerted police officers. The officers arrived on the scene just as the bus was leaving and they managed to stop the bus and arrest the assailants. The victim later died of his injuries.

Two important points are raised by this particular case. The first is that officers have to be able to respond to incidents very quickly. Without a rapid response, the assailants may have escaped on the bus before officers attended the scene. It would then have been more difficult and more time consuming for investigating officers to identify the assailants from the pictures recorded by the system.

The example also illustrates the evidence gathering properties of the system and its value in directing investigations. Even though many people witnessed this event, the availability of a tape recording of the incident is estimated to have saved the force thousands of pounds in resources and time spent investigating the case. Recordings of disturbances, which sometimes involve several people, are especially useful because they provide the police with hard evidence which can be used to resolve discrepancies raised by the accounts of an incident given by different people.

Twenty five percent of the arrests made by the operator mentioned above were for the possession and use of cannabis. The lack of official data backing this finding may be due to the fact that these incidents do not end up in official statistics -as officers may choose to administer an informal caution to the offender.

He had also made a number of arrests for criminal damage, burglary and, to a lesser extent car theft. By the time this operator started in March 1994, however, offenders might have already begun to be more careful about which premises they attacked. One incident of burglary occurred when the offender managed to gain access to a covered arcade within the city centre by squeezing through the gap underneath the iron gates at the entrance to the arcade. The offender was then able to commit the offence outside the range of the cameras. Case study 4 indicates that burglars may even be testing the system before committing offences.

Case study 4

One evening at approximately 12 midnight, the CCTV operator noticed a man with a ski mask emerge from one of the arcades within the city centre. Officers were alerted and attended the scene minutes later, but found nothing suspicious. Approximately five hours after this, one of the shops within the arcade was broken into and electrical goods were stolen. The offenders used another exit to escape thus avoiding being caught on camera.

The various case studies presented above give some idea of the importance of quick and effective communication in combating crime within the city centre. To reduce the burglary rate even further within the city centre area, the police may require more immediate communication from other organisations who operate there. Case study 5 indicates that other agencies have an important role to play in communicating information to help the police tackle burglary.

Case study 5

Whilst on patrol, an officer noticed that there had been a break-in at a shop within the city centre. The alarm was ringing and property had been stolen. Approximately half an hour after the officer reported the offence, the alarm company contacted the police to inform them that the alarm at these premises had been activated. Had the alarm company informed the police immediately, the CCTV operator might have been able to catch the offenders in the act.

Conclusions

The findings presented here provide compelling evidence that initially the presence of CCTV cameras within Newcastle city centre had a strong deterrent effect on the incidence of a number of offences. However, there is also evidence to suggest that the effect of the cameras on some offences began to fade after a period of time, although it is important to note that the central division is faring better than the control division and the rest of the force. The use of cameras has had a lasting effect on burglary and criminal damage. This may be due to the increase in risk of detection associated with these two types of offences within the central area.

On the basis of the evidence presented here, the number of public disorder incidents has remained unchanged since the installation of the cameras. But as the case study and arrest data show, the strength of CCTV systems might lie less in preventing these offences (which it is argued will occur regardless) than with co-ordinating a quick effective response and gathering evidence should it be required. A quick response may mean that officers are able to defuse a situation before it becomes serious, or at least reduce the harm done to one of the participants. Providing evidence can direct investigations, saving officers both time and money.

It was not possible as part of this study to collect any data concerning the use of CCTV evidence in the prosecution process. Peter Durham, the local police commander claims that.

Almost all of the 400 people arrested as a direct result of the scheme admitted guilt after being shown video footage, therefore avoiding the considerable costs associated with contested trials. (Durham 1995, page 20).

Although it is impossible to say how many of these 400 would have been arrested and then gone on to plead guilty in the absence of any video footage, the indication is that the system has contributed significantly to the prosecution process.

For all the offences examined above, there is little evidence to suggest that crime has been displaced either to other locations or from one type of offence into another. In fact there is some evidence to indicate that there has been some 'diffusion of benefit' to the no CCTV area especially for criminal damage and burglary offences, ie the beneficial effect of CCTV extends beyond the area immediately supervised by cameras to neighbouring areas which are not directly covered.

4. Birmingham

Birmingham is England's second largest city. Its centre, like Newcastle, has a low resident population but has many shops (including three large shopping centres and one smaller shopping centre), offices, and licensed premises which mean that the area is always busy with people and motor vehicles. The city centre is also a popular venue for organised activities. The streets have been used for a number of sporting events, such as the Kelloggs cycle race, and have played host to a number of visiting dignitaries. Moreover, throughout the late 1980's and early 1990's, Birmingham city centre became a very popular venue for rallies, demonstrations, protests and marches organised by a wide variety of different organisations. These events, therefore, have presented the police in Birmingham with major security and public order problems.

As the popularity of Birmingham city centre increased during the late 1980's, general public safety within the city centre became a major issue. In 1989, the local police commander suggested to the Birmingham City Centre Association that CCTV be installed within the City Centre. The purpose of the system was not only to help with policing of large demonstrations but also to help make Birmingham a safer place through tackling the problems of general street crime such as robbery, theft from the person, criminal damage and assault. The association approved the suggestion and in 1989 the Citywatch trust was formed.

Citywatch put forward ambitious plans for a 27 monochrome camera system along with the infrastructure for an additional 21 cameras. Installation of this system was to take place in four stages. The first phase involved installing cameras in the central core of the city; the second phase involved installing cameras in the market areas of the city; the third and fourth stages involved placing cameras within the entertainments area and in the area surrounding the new convention centre.

The first two phases of the system were set up with the aid of private sponsorship and a 'Safer Cities' Home Office grant in 1991. Nine pan, tilt and zoom cameras were installed at previously identified problem locations around the city centre core and market areas. These cameras became operational in March 1991. Since this time, three additional pan, tilt and zoom cameras have been installed: two in the entertainment area (installed in November 1991) and one additional camera in the town centre shopping area (installed during the summer of 1994).

BIRMINGHAM

The images from all of these cameras are transmitted, via fibre optics, to 10 monitors housed in the main control room at Steelhouse Lane, the local police divisional headquarters. All the images are recorded in time-lapse mode and there is a facility which allows the operator to switch to real-time recording if necessary. There is also a facility for producing hard copies of images which provide further evidence of incidents that occur.

Since the first cameras were installed in 1991, Birmingham city centre has undergone major-re-development. This has included pedestrianising the main city centre streets, dismantling parts of the inner ring road and removing pedestrian subways and underpasses. During this same period, the police division responsible for dealing with the city centre has been reorganised and there has been an extension of the liquor licensing hours at the licensed premises with the centre.

The area covered by the cameras consists mainly of shopping streets and partially open market areas. There is also some coverage of the financial district, where the Bank of England is located, and the entertainment district which is located some way from the city centre core. It is important to note that the city centre of Birmingham extends over a larger area than the centre of Newcastle (see figure 11 which also shows the position of the cameras). It is also more complex in layout and has a greater number of natural obstacles to coverage by cameras (see figures 12, 13 and 14). In addition, there are currently only 14 cameras located in the town centre, two less than in Newcastle city centre.

Figure 11 Camera coverage within Birmingham city centre. The round marks represent camera positions. The solid line represents the boundary of Zone A and the dotted line represents the beat boundaries.



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Figure 12 The piece of street furniture is a considerable obstacle to the view of camera nine



Figure 13 The trees to the right of the obstacle in figure 12, when in full leaf, are also considerable obstacles



Figure 14 When in full leaf, the trees pictured here seriously affect the view of cameras 12 and 7



The aims of the system

The ultimate aim of the CCTV scheme in Birmingham city centre, and the Citywatch trust in general, is to 'make the city a safer place'. According to promotional literature, the system is used to benefit city centre users in a wide variety of ways but specific consideration is given to the:

- early detection of public disorder, anti-social behaviour and crime in order to prevent its escalation, minimise its harmful impact and aid the identification and apprehension of offenders;
- deterrence of public disorder, anti-social behaviour and crime;
- reduction of general levels of fear of crime within the town centre;
- early detection of vehicular congestion to facilitate the optimal deployment of traffic control resources;
- assistance in the general management of city life.

Operational procedures

As in Newcastle, the system is entirely controlled by the police. Civilian staff, employed by the police authority, monitor the images from the cameras twenty four hours a day in the local control room at Steelhouse Lane. These people work on a similar 8 hour shift pattern.

Within the control room, there is a bank of 8 split screen monitors and one single image monitor. There is also one additional remote monitor which is used by the officers who work on the control desk. This monitor, although controlled by the CCTV operator, is used by the control room staff as an aid to the deployment of resources. The control room staff provide the link between the camera system and the officers on the ground. There is also a second radio link, which allows city centre officers, traders and camera operators to communicate with each other.

How the system is used in Birmingham

The way in which the operators use the system in Birmingham is very similar to the operation in Newcastle. The operators patrol the areas covered by cameras, keeping an eye on local 'characters', looking out for incidents which

BIRMINGHAM

may require a police response and helping to co-ordinate the police response. The system is also used proactively either in organised operations or on a more ad hoc basis, for example in response to a request from an officer on patrol or another person on the radio link.

According to the most recent Citywatch review, the vast majority of the cameras were installed to monitor people and traffic movement, and criminal activity at selected sites within the town centre. There were, however, subtle differences in the types of problems which certain cameras were installed to deal with. Camera 2, for example, was located on the Grand Hotel to deal with "robberies and street violence in the area of the bus shelters of Colmore Row, alongside the Cathedral Square" (see figure 11). Camera 7 was located at Waterloo Street to "monitor activities within the finance area ... with specific relation to robberies in banks and building societies". A number of cameras were also located along the 'Triangle Route' to monitor the activities of people on marches, parades and processions.

In practice the operators use the system to deal with a wide variety of (offences and anti-social behaviour. Camera 9, which is widely accepted to be the most effective camera, covers the ramp which leads up to the Paltasades shopping centre (see figure 11), Corporation Street and New Street. In addition to dealing with street robberies, the operators use this camera to help deal with illegal street traders and beggars. Camera 7, the main purpose of which was to monitor the activities within the financial district has also been used to help keep an eye on vehicles parked in Waterloo Street (see figure 11). Camera 2 which was intended to deal with robberies committed at the Bus Shelters on Colmore Row, can also be used to check on vehicles parked on Church Street (See Figure 11).

Cameras 13 and 14 have proved very useful in dealing with criminal activity such as gang robberies in the market areas and have also been used to provide surveillance cover for undercover operations against 'dippers' (i.e. purse thieves). Cameras 17 and 18, located in the entertainments areas of the city have proved very useful in helping deal with assaults, violent disorder and assaults on police officers.

The effect of CCTV on recorded crime in Birmingham city centre

For the purposes of evaluation, the police in Birmingham provided recorded crime data for the following offences:

- Robbery and Theft from the Person Theft from Vehicles
- Theft of Vehicles
- Wounding and Assault (a combination of sections 18, 20 and 47 of the Offences against the Person Act, 1861)
- Burglary Other Buildings
- Criminal Damage

The data cover one year before installation (1990) and almost three years following installation and are derived from a re-analysis of Local Intelligence Office routine monthly bulletins.

Consideration needs to be given to the locations where CCTV would be expected to have an impact, whether or not there is any displacement of crime to adjacent areas and the extent to which the impact of CCTV can be disentangled from any division-wide variations in crime. In considering these issues it is necessary to outline the division and zone structure of the West Midlands Police force. During the period under consideration, the West Midlands Force was made up of 11 Divisions. Division F covered the City Centre and is the focus of this study. The division itself was and still is divided into 7 zones. Zone A of Division F is the City Centre Zone and is the one that would be most affected by CCTV installation. Of the 29 streets/areas identified by the police as having at least some degree of CCTV coverage, 26 are in Zone A (see figure 11). It was therefore decided to focus on Zone A for evaluation purposes.

It is clear from figure 11 that not all of Zone A is covered by the cameras. In fact all nine of the original cameras were located within one beat area. Unfortunately, due to a re-organisation of beat boundaries, crime figures broken down to beat level are only available from the month that cameras were installed (1 January 1990). Figures for this beat (Beat 1), have been obtained and analysed in order to give a better idea about the effect the cameras have had on different types of crime.

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All the following charts are based on indices for the respective areas. This means that each month's figures are represented as a percentage of the base figure, which for these charts is the number of incidents that occurred during January 1991 (i.e. the month that the cameras were first installed). To make the comparisons clearer, quarterly moving averages of the monthly indices have been presented.

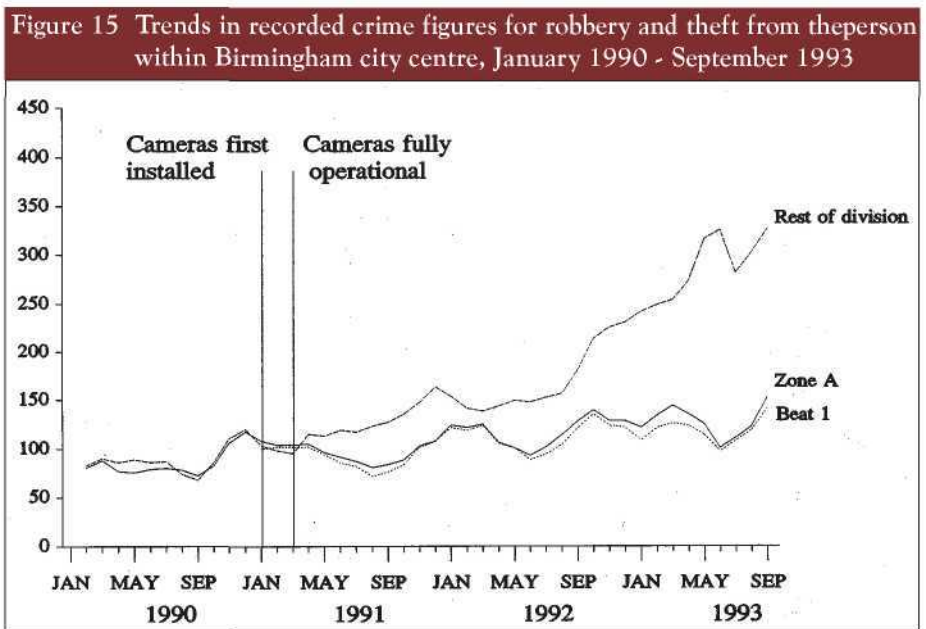
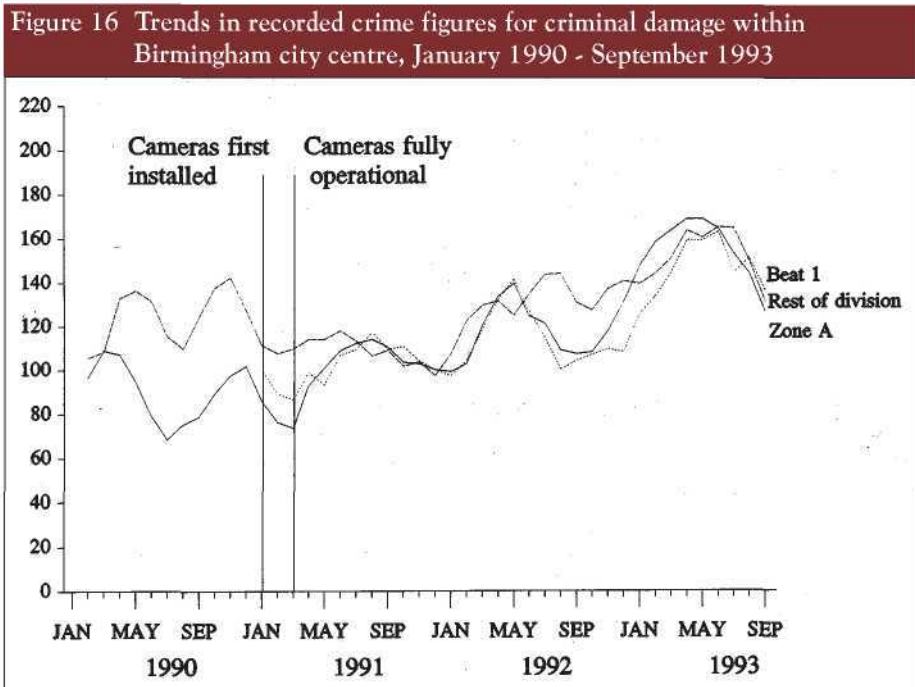


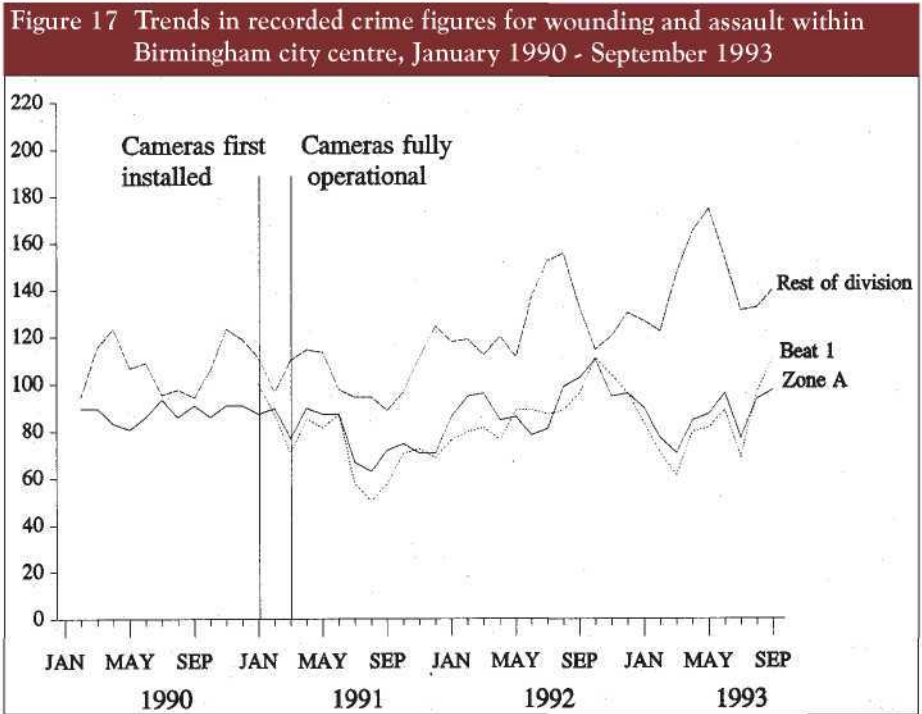
Figure 15 shows the effect of the installation of cameras on robbery and theft for the different zones of Division F. These types of offence are considerably more likely to occur in Zone A than any of the other zones in Division F, and, according to the police, they are directly targeted by CCTV.

The presence of cameras does appear to have had some effect on the incidence of robbery and theft from the person within Zone A. Prior to the installation of cameras in January 1991, the changes in the rates for robbery and theft from the person for all zones within Division F were very similar. Since the installation of cameras, the incidence of these types of offences in areas surrounding Zone A has increased sharply, and by the end of the study period, the number of offences per month is over three times as high as when the cameras were installed. In Zone A and Beat 1, though the number of offences has increased this is much less marked.

This pattern is not repeated for the other offences targeted by CCTV. The rates for criminal damage in Zone A, Beat 1 and the rest of the division show very similar rises over the study period (see figure 16). The rates for wounding and assault (see figure 17) have remained fairly stable in all areas since the cameras were installed. There is some evidence that the incidence of wounding and assaults over the last 12 months of the study period have started to rise in surrounding areas when compared to the central area. It is, however, not possible to attribute this small change to the presence of CCTV within the central area.

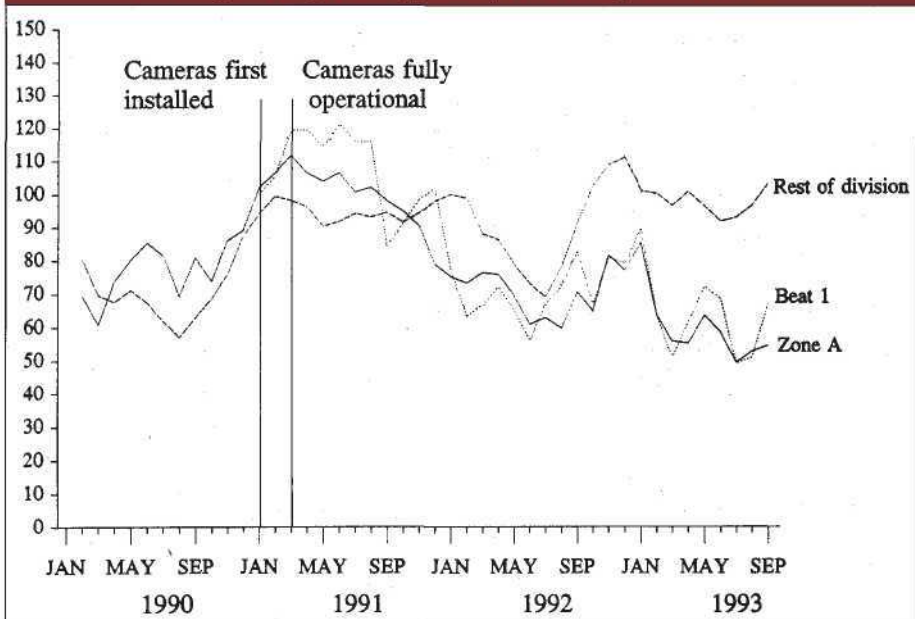


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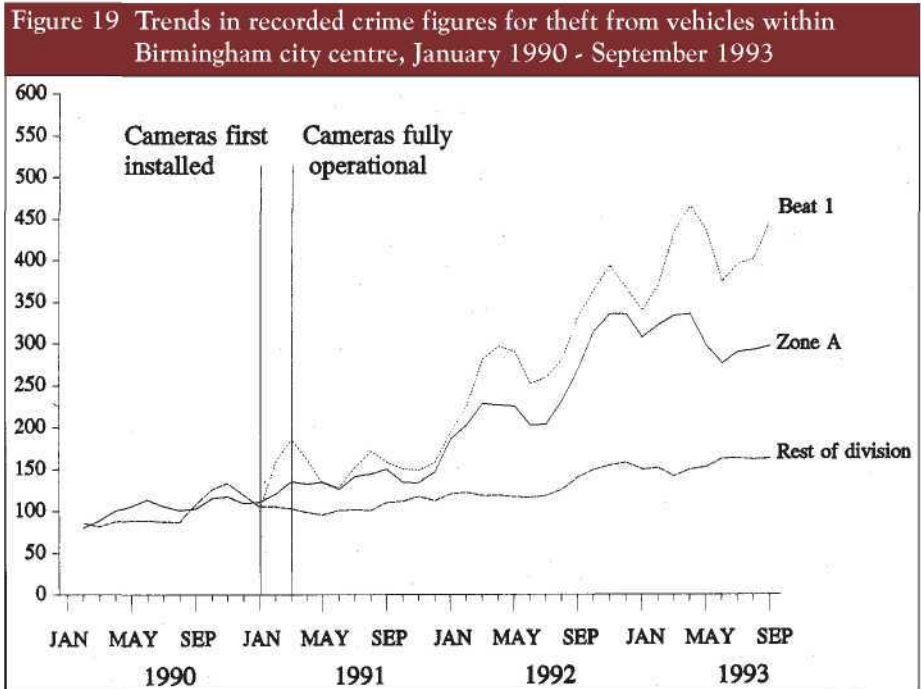
It is difficult to say what effect the presence of CCTV cameras has had on vehicle crime. The rate of thefts of vehicles within the division as a whole rose sharply in the year before the cameras were installed. The rate for Zone A and Beat 1 consistently declined over the two and a half year period after the cameras became fully operational in March 1990 (see figure 18) while the rate for the surrounding zones over the same time period remained fairly stable.

Figure 18 Trends in recorded crime figures for theft of vehicles within Birmingham city centre, January 1990 - September 1993



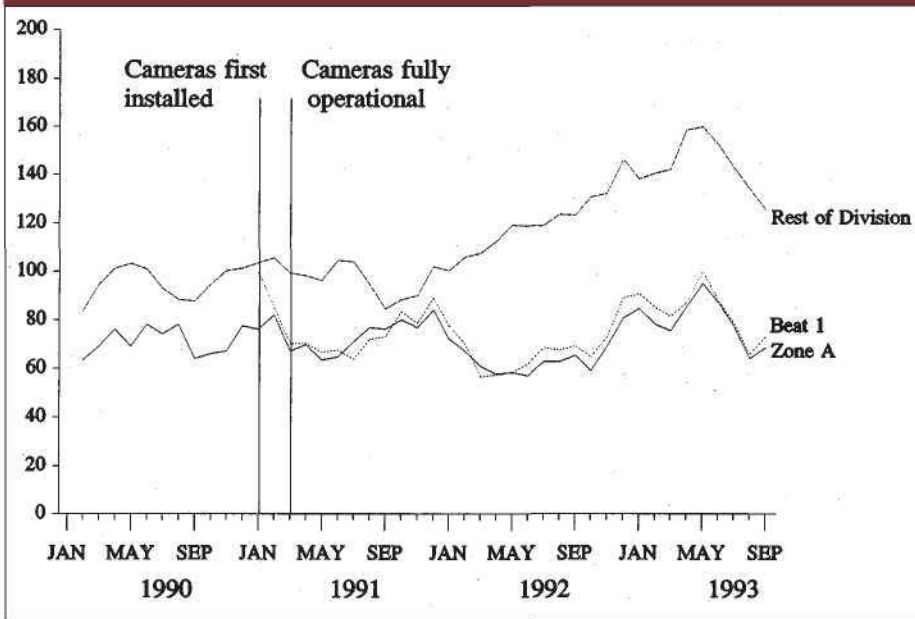
The reasons for this reduction in car theft are not clear. It may be that car thefts have declined in those areas covered by cameras. However, the system was not intended to deal with car crime and does not cover many areas where vehicles are parked. A more feasible explanation, therefore, may be that the various traffic calming measures (including pedestrianisation) installed by the council at around the same time as the installation of the cameras contributed to this reduction in the number of vehicle thefts in Zone A. More detailed analysis is required to explain this pattern.

Figure 19 shows that at the same time that thefts of motor vehicles were reducing in Zone A and Beat 1 thefts from vehicles were increasing dramatically in these areas, a pattern not shown for the rest of the division. This supports the view that it is the changes in vehicular access that have impacted on theft of motor vehicles in the city centre rather than supervision from CCTV, since if CCTV was the key in reducing theft of motor vehicles, one would have expected it to have reduced theft from motor vehicles as well. This pattern for theft from motor vehicles also suggests that there may have been some displacement of offending into thefts from vehicles since the installation of cameras.



The final category under consideration burglary from shops. Figure 20 shows that once again Zone A and Beat 1 have fared well in comparison to the other zones in Division E. By the end of the period under consideration, burglaries in the areas with CCTV coverage had not increased as they had in the surrounding zones. However, close inspection of the crime figures reveals that it was not until 8 months after the cameras had gone fully operational that the burglary rate for the surrounding areas began to rise and so it is difficult to attribute the good performance within the central areas to the presence of CCTV alone. It was at this time (ie November 1991) that the city centre pedestrianisation scheme was completed and it may be an interaction of the presence of cameras and pedestrianisation that produced this effect.

Figure 20 Trends in recorded crime figures for burglary other within central Birmingham, January 1990 - September 1993



Successful uses of CCTV

In 1994, the CCTV system was used to help the police deal with 458 incidents (see table 4), of which 173 resulted in arrests. The cameras were of most benefit in helping the police deal with public order problems: forty five percent of the 458 incidents were related to public disorder of one sort or another, ranging from serious assaults to 'nuisance' incidents on the streets. In sixteen percent of cases the cameras were used to monitor the movements of suspicious persons. In almost one fifth of these incidents, however, the cameras were used to help officers respond to burglaries, ram raids, shoplifting incidents and robberies.

Table 4. Police use of CCTV within Birmingham city centre during 1994

	N	%
Public order	128	28
Nuisance, drunks, begging	78	17
Suspicious persons	73	16
Burglary, thefts, ram raids	52	11
Traffic	34	7
Robbery	34	7
Alarms	20	4
Criminal Damage	20	4
Injury	6	1
Indecency	5	1
Missing persons	4	1
Vehicle crime	3	1
Warrant	1	0
Totals	458	100
1. Source: Goodwill Associates		

Taken together with the crime figures this suggests that successful intervention using cameras has had some effect on the number of robberies, thefts and burglaries. Successful intervention on public order incidents, however, appears to have had less effect on the overall incidence of these offences. This may be due to the fact that public order offences are fuelled by alcohol and offenders will indulge in this type of behaviour regardless. Alternatively, it may be the case that although such incidents continue to take place, they are by nature less serious because of the improved police intervention caused by camera coverage. Unfortunately the data were not detailed enough to test this hypothesis.

Survey of members of general public

In order to assess the impact of the system further, the Home Office funded two surveys of the general public in Birmingham city centre. One survey took place in December 1990 immediately before the installation of cameras and the second, one year later. Approximately 700 people took part in each survey and the aim was to assess any changes in self reported victimisation and fear of crime 12 months after the installation of the cameras.

Interviewers asked individuals to give details about how often they, or someone they knew, had been victimised in the previous 12 months within Birmingham city centre. They were also asked to give more precise details about the most serious offence of which they had knowledge. Information about fear of crime in the city centre was also collected.

Table 5 shows that after CCTV was introduced a lower proportion of people were victimised in streets where there is a good CCTV view. In surrounding streets where there is little or no CCTV coverage, victimisation had increased. These data reinforce the findings from the analysis of the police recorded crime statistics that CCTV has had a beneficial effect but that some displacement may have occurred.

Table 5. Incidents experienced in Division F in a one year period before and after the installation of CCTV				
	All offences ¹		Most serious	
	Before	After	Before	After
Area 1: Streets with good CCTV view	163 (50%)	156 (39%)	325 (50%)	274 (41%)
Area 2: Streets with partial coverage	19 (6%)	44 (11%)	52 (8%)	66 (10%)
Area 4: Other streets in Zone A of Division F	26 (8%)	60 (15%)	59 (9%)	73 (11%)
Area 5: Streets in zones B-G of Division F	33 (10%)	48 (12%)	65 (10%)	94 (14%)
Unclassified	84 (26%)	91 (23%)	149 (23%)	161 (24%)
Total	325 (100%)	399 (100%)	650 (100%)	668 (100%)
<ol style="list-style-type: none"> 1. Respondents were asked about their experience of a number of offences. Respondents experienced some types of offence so often that they were unable to quantify their experiences. These figures, therefore, include frequencies only for those offences that respondents could quantify. 2. Includes frequencies for all types of offence. 3. Source: Self report survey, Birmingham city centre. Survey conducted on behalf of the Home Office by staff from Michael and Associates. 				

The time of day when the most serious incidents¹ occurred is broadly the same for both surveys, with around half of the incidents occurring during the day, a third during the evening, and the rest at night. It is not the case, therefore that there has been any significant shift in the timing of offences within the CCTV area to different times of day when it may be perceived that the CCTV cameras were less effective (for example at night when the cameras might be unmanned or the operators might be unable to see because of the dark).

It has been argued by members of the general public (see group discussions summarised in Honess and Charman, 1992) that knowledge of CCTV may impact upon individuals' reactions to crimes. For example, people may be more prepared to report a crime if they thought CCTV was there to 'back-up' their story. On the other hand, they may be less likely to report a crime if they thought the cameras were constantly monitored by police.

An open ended question was asked of respondents in respect of the most serious incidents' - "what was your reaction at the time?" (if the incident was observed or directly experienced). Although 40% of respondents reported that they were aware of CCTV, there was not one mention of CCTV in response to the open ended questions. There is no evidence from this data that knowledge of CCTV makes people who witness crimes, or are victims of crimes, act differently.

The findings also indicated that there was very little change in the general fear of crime amongst those who were interviewed or their feelings of safety within the city centre during the day. There was, however, an increase in feelings of safety for respondents using the city centre after dark amongst those *who were aware that the cameras had been installed* (see table 6).

Table 6. Feelings of safety in Birmingham city streets after dark

	Before CCTV		After CCTV			
			All	Those unaware of CCTV	Those aware of CCTV	
Very safe	32	(5%)	31 (4%)	11 (3%)	20 (7%)	
Safe	156	(22%)	176 (25%)	95 (23%)	81 (29%)	
Bit unsafe	213	(30%)	179 (26%)	115 (27%)	64 (23%)	
Very unsafe	305	(43%)	313 (45%)	198 (47%)	115 (41%)	
Valid totals	706	(100%)	699 (100%)	419 (100%)	280 (100%)	

1. Source: Self report survey, Birmingham city centre. Survey conducted on behalf of the Home Office by staff from Michael and Associates.

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Data were collected on both survey occasions from an additional 100 respondents who frequently use Birmingham city centre at night in order to maximise the range of city users contacted. Those interviewed at night were less fearful of crime generally than those interviewed during the day (see table 7). They were also less enthusiastic about the impact the cameras had on their feelings of safety at night.

Table 7. Differences in responses between night and day respondents		
	Day Surveys	Night Surveys
No worry/occasional doubt about becoming victim of crime	44%	59%
Very safe/safe walking alone after dark in city centre	28%	38%
CCTV would make no difference to how safe they felt at night ²	53%	65%
CCTV made them feel a 'little safer' at night	39%	27%
<ol style="list-style-type: none"> 1. Source: Self report survey, Birmingham city centre. Survey conducted on behalf of the Home Office by staff from Michael and Associates 2. Data collected on 'before' survey only 		

Conclusions

The self report data concerning victimisation indicate that crime has reduced in those streets where there is a good CCTV view. Moreover, evidence from the analysis of recorded crime data suggests that the presence of cameras has had most effect on robbery and theft from the person. There is also evidence to suggest that the cameras may have acted in conjunction with pedestrianisation and other traffic calming measures to reduce the incidence of burglary within the city centre. In general, however, these findings indicate that there have been reductions in crime in those streets with a good CCTV view, and that this reduction is most noticeable for robbery and theft from the person.

Both the survey data and the recorded crime data indicate that offending has increased in areas where there is partial or no camera coverage which suggests that some locational displacement of crime may have occurred. This is most evident for robbery and theft from the person. It is unclear, however, how far the increases in these offences in surrounding areas are a direct result of crime displacement, or of an increase in opportunities within these areas. It is possible that the extensive re-development that has taken place within areas outside the central zone, which has resulted in an increase in the number of entertainment venues, may have increased the number of potential targets for this type of offence

Evidence from the analysis of recorded crime data, however, does point more convincingly to displacement of criminal activity to theft from cars and, in particular, displacement of offending from robbery and theft from the person into theft from cars. The charts for these two offences are almost mirror images of each other. In Zone A, robberies and thefts from the person have remained relatively stable, whereas thefts from vehicles have increased significantly; for the surrounding areas the opposite is the case. It is likely that many thefts from vehicles will take place in the car parks which are not covered by CCTV.

From the evidence presented here, it appears that the presence of cameras has had a distinct and complex effect on the pattern of local offending, it suggests that within the city centre area, the system has perhaps acted to curb the increase in certain types of offence, namely robbery and theft from the person, rather than reduce their overall incidence. It has achieved this by reducing crime in those areas with good camera coverage but there is also considerable

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evidence that offending is now more common in those areas where there is little or no coverage.

A number of factors may be responsible for the apparent effects. The city centre, unlike that in Newcastle, covers a wide area and extends well beyond the area covered by cameras. There are also a greater number of natural obstacles, such as street furniture and trees. This presents a difficult environment for effective CCTV surveillance and means that there are a number of locations that crime can be displaced to, and as crime is displaced over time from one area to another, it may change in its nature. For example, the cameras may help to prevent crime, predominantly robbery and theft from the person, on those streets with camera coverage within the city centre core area. However, crime may have been displaced to other local areas, such as the recently developed convention centre area of the city and the car parks. Within the convention centre area, robberies and thefts have apparently increased. Because of local circumstances, the displacement of offending to the car parks has manifested itself in theft from rather than of vehicles.

It is also important to recognise that because Birmingham was one of the first city centre schemes in the country, the police and council could not learn from the experience of others and this may have been reflected in the way that they set up the scheme in the first place. Citywatch recently commissioned a review of the system which recommended that camera positions should be modified in the light of changes suggested by Aldridge (1994) in his publication '*CCTV operational requirements manual*.'

The failure of the camera system to reduce directly overall crime levels within Birmingham city centre does not detract from the other less evident benefits of the system. The system has helped police officers working within this area deal with many problems, most notably a wide range of public disorder/public safety problems. It has also increased the public's feelings of safety when using the city centre at night, and this may be as important for the city centre as an area as any real reduction in crime.

5. King's Lynn

King's Lynn, in Norfolk, is an historic market town surrounded by large areas of agricultural fen land. The town has one of the most established and extensive CCTV schemes in the country. Cameras were originally installed on the North Lynn industrial estate in 1987 but the system has been, and continues to be expanded. There are now 60 monochrome cameras at various sites and buildings around the town centre, with plans for an additional 30 cameras.

The original scheme was set up to tackle burglary and damage on the North Lynn industrial estate. This estate is about one and a half miles out of the town centre and is situated next to one of King's Lynn's problem housing estates. Before the installation of cameras in 1987, the industrial estate suffered very high level of burglary and criminal damage, and businesses had started to move off the site. In response to these problems, the council, the police and the industrialists adopted a partnership approach and formed an industrial association which acted to improve security, replacing the perimeter fence and improving surveillance by clearing obstacles and installing cameras. The scheme was a resounding success as the crime rate on this industrial estate fell sharply.

The second phase of the scheme which took place in 1992 involved placing cameras in a number of sites around the town centre. Nineteen cameras were installed to monitor activity in the town centre surface car parks and initially were to be used to tackle car crime, but have also been used to monitor activity in the different locations that surround the car parks. These locations include the roof tops and rear access to the shops and houses located near the car parks (see figure 21), the access to public houses and other entertainment venues, the cash point machines, the town's major thoroughfares (see figures 22 and 23) and a local bridge used by drug users (see figure 24).

Figure 21 The car park cameras in King's Lynn also cover the rear access to and rooftops of local shops and public houses



Figure 22 Major vehicular thoroughfares are also covered by the car park cameras



Figure 23 Two of King's Lynn's car parks also serve as market places. Note the camera can monitor activity outside surrounding buildings



Figure 24 A common ground for drug users



Cameras were also installed at this time at a large sports centre and on a small housing estate near the centre of King's Lynn. The cameras at the housing estate were installed to tackle late night vandalism and rowdy behaviour. The problems were mainly due to youths who, attracted by a number of fast food premises situated nearby, congregated near the flats late at night. The cameras were installed at the sports centre as a precautionary measure. Whilst the centre was being constructed the site was damaged and suffered from arson attacks. Site equipment was also stolen and so it was felt that it was necessary to install cameras to protect the site once it had been completed.

A further six cameras have now been installed in the pedestrianised part of the town centre to tackle the problem of general disorder, theft, burglary and damage. This phase of the scheme was launched by then Home Office Minister Charles Wardle in June 1994. Cameras have also been installed at the hospital three miles from the town centre to tackle car crime and to improve the safety of the staff working at the hospital.

The funding for the system comes from a variety of sources. The majority of the money has come from adding 10p on each ticket tariff for users of the town centre car parks. Retailers in the town centre and traders on the industrial estate have also contributed a substantial amount to the running costs of the scheme. Costs have also been recovered from an increase in rents on those housing estates covered by CCTV and through the charges at the local sports centre.

Up until the summer of 1994, the cameras at the hospital and the housing estate were static but these have now been upgraded. Most cameras now have a pan, tilt and zoom facility and some also have an infrared facility for better vision at night. The images are transmitted via fibre optics to 23 monochrome monitors located in a central control room in the town council buildings. Fifteen of these monitors are split screen, the remaining eight are single image. All images are recorded in multiplexed time lapse mode and if an incident takes place an additional recording can be made in real time. There is also a facility for producing hard copies to provide additional evidence.

Procedures for monitoring the system have recently been re-organised. A team of security staff which works at the town council building is now responsible for monitoring all the cameras. Before the cameras were upgraded staff at the hospital and sports centre were responsible for monitoring the cameras at these sites.

The aims of the scheme

The aims of the town centre system are to detect and record incidents of car crime, criminal damage, public disorder, nuisance behaviour, burglary and robbery. According to the guidance for control room staff,, the aim of the cameras within the car parks is:

1. To detect and record incidents involving the theft of vehicles, theft from vehicles and vandalism to vehicles.
2. To detect and record incidents involving public order offences.
3. To detect and record incidents such as the unauthorised depositing of litter or refuse.
4. To assist the Council with carrying out surveys from time to time.
5. To assist with the security of cash collection from ticket machines.

The aim of the town centre cameras is to:

...deter acts of vandalism and criminal damage, smash and grab raids etc. in the streets covered. In the event that deterrence is ineffective the cameras are intended to detect an incident at the earliest possible moment. Acts of vandalism etc. are more likely to take place after shops and stores have closed and particularly after closing time in pubs and clubs. Special attention should therefore be paid to town centre cameras at the most sensitive times.

Operational procedures

The images are monitored 24 hours a day by private security staff who are based at the council offices. There is a direct telephone link between the operators and the control room at the police station, where there is also a remote monitor. As part of the reorganisation that took place in the summer of 1994, a radio link system was introduced. This allows the camera operators to communicate with in-store security staff within the town centre.

Staff are advised to carry out regular camera 'patrols':

Ideally, every camera should have at least one (but preferably more) "home" position, whereby it can see, in general terms, the whole of the area under surveillance. In a comprehensive scheme such as this it has not always been possible to locate cameras in the "ideal" position, nor has it been possible to have as many cameras as we would have liked to give total coverage. It is therefore necessary to ensure that proper camera patrols are carried out at reasonable intervals.

On detecting an incident they are advised to:

...closely monitor occurrences on the appropriate desk monitor, recording the same on the appropriate event recorder, notifying the police by direct telephone line, transmitting the appropriate picture to the remote monitor screen in the police station and recording incident details in the incident log book provided.

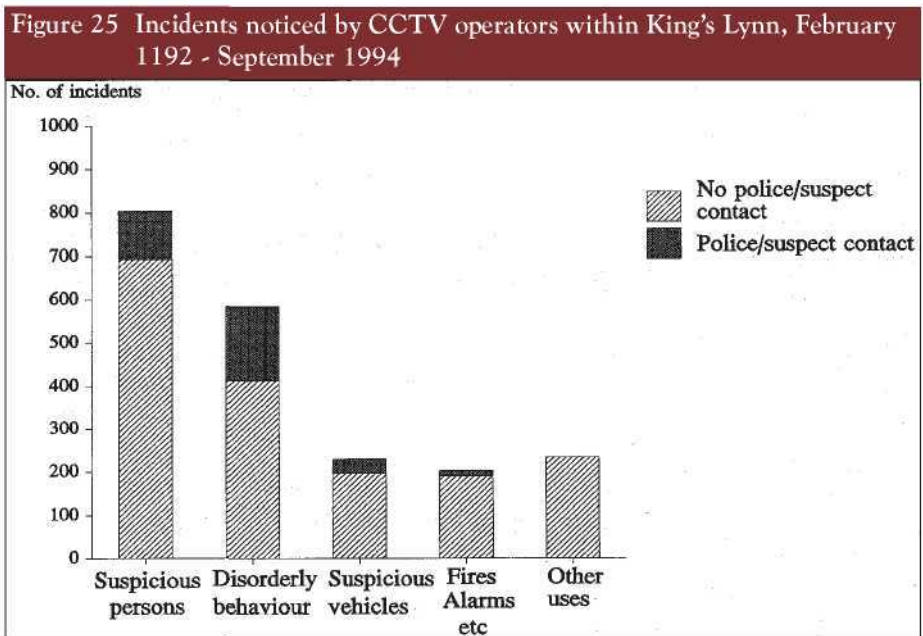
The staff at the police control room have no direct control over the cameras but can request that certain cameras be moved and focused to areas where incidents have been reported.

How the system is used in King's Lynn

The system in King's Lynn has a wide variety of uses. In addition to tackling crime and disorder, the cameras are used to assist with routine town centre management. For example, the operators use the system to monitor unlicensed taxi cabs, illegal parking, littering, the tide level on the local River Ouse and the daily car park 'cash-run'.

For any incident monitored by cameras, the operators produce a written record of the event. These reports have been analysed to give some idea of how the system is being used. Before examining the results, it is worth mentioning that, in addition to the normal measurement error that arises when classifying data, there will also be errors arising from the recording of incidents by the operators themselves. What one operator considers significant may differ from that which another operator considers significant. Therefore these results are intended as a rough guide as to how the system is being used in King's Lynn. 4091 incidents recorded over a 32 month period (February 1992 - September 1994) were analysed. These incidents originate from two sources: the operators notice the incident themselves or have their attention drawn to them as a result of a request either for immediate surveillance or a subsequent tape review.

Half of the incidents were first noticed by the operator and figure 25 gives a breakdown of these type of occurrences.



The largest category of incidents is 'suspicious' persons. This refers to people, mostly youths, whose behaviour the operators felt uncertain about. In a significant number of cases, the cameras were used to monitor the movements

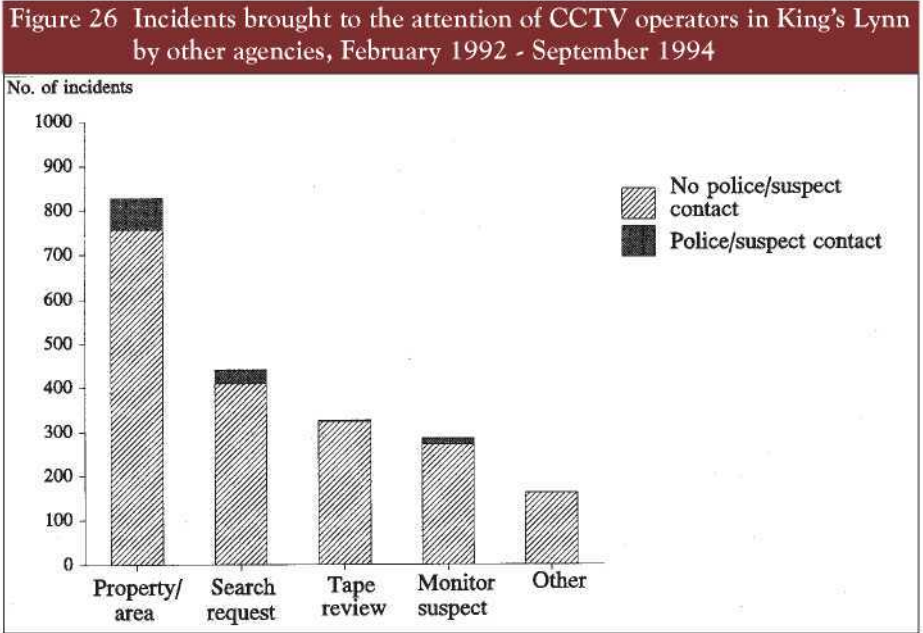
of well-known 'trouble-makers'. However despite the reservations of the operators or maybe because of their attention, the subjects of these incidents did not go on to commit offences.

Camera operators also noticed many incidents of disorderly behaviour of one sort or another. This includes unruly behaviour, which mostly refers to youths messing about, and people dropping litter and urinating in the street.

Sixteen percent of incidents first noticed by the operator resulted in police officers contacting a suspect. About half of these resulted in arrest, and these 140 incidents are shown in table 8. In the 32 month period under examination, 56 of these incidents resulted in arrests for public order offences such as littering, urinating, disorder and criminal damage, and 30 resulted in arrests for property offences such as theft and burglary.

Offence Incidents	Noticed by operator	Incidents brought to operators attention by others			Arrests ¹
		Suspects located using CCTV	Suspects' movements using CCTV operator	Identification of suspects from tape review	
Littering/urinating	24				37
Traffic/driving	24	2			33
Fight/disorder	18		1		32
Drugs	14		1		29
Damage	14	2	1	1	28
Theft (incl. attempts)	13	1	4	1	25
Shoplifting		4	3		20
Stolen Goods	9				17
Theft off/from vehicle (incl. attempts)	6	2			16
Smash and grab (incl. attempts)	2	2		1	7
Other	16	8	5	0	37
Total	140	21	15	3	281
1. One incident often results in more than one arrest.					

Approximately half of all incidents recorded over the 32 month period were brought to the operators' attention by others (figure 26).



The most common source was officers within the police control room who asked for surveillance of an area because they had received information about an on-going incident. In some instances, the police controllers then used the cameras to help decide what type of response, if any, was necessary. In others, a police response had been made and the system was used to monitor it. The cameras proved especially useful in helping to deal with hoax calls and activated alarms without having to commit police resources. In addition, the police controllers often requested that the operators carry out searches for vehicles or particular people, most of whom they suspected of being involved in a recent offence (see case study 6).

Case study 6

This case study illustrates how a CCTV system can be used to tackle organised shoplifting teams by gathering evidence monitoring movements of suspects, informing shop security staff and helping to co-ordinate a police response

Police officers requested that a vehicle be kept under observation. When the five occupants returned to the vehicle, the operators alerted police officers who attended the scene immediately. Whilst the officers were talking to the driver of the vehicle, one of the other occupants was seen by the camera operators to slip an object out of his sweater and pass it to another of the occupants, who then began to walk off. As she walked off, she was joined by another person. The cameras were then used to monitor the movements of the two suspects around the town centre. The radio link was also used to alert shop security staff to the presence of the suspects. When officers in the control room had decided there was enough evidence to arrest the suspects, a message was sent out to this effect. All six people were subsequently arrested and charged with shoplifting offences.

Only six percent of the incidents brought to the operators' attention resulted in police contacting a suspect and usually the role of the camera system was to monitor the movements and/or the arrests of suspects. The cameras were also used to locate suspects although this was less common. It is worth noting that although over 300 tape reviews were carried out, only in three cases did this result directly in the identification of a suspect. In the vast majority of cases when officers requested tape reviews of areas where crimes had been committed, nothing of particular use had been recorded by the cameras.

Thirty nine incidents brought to the attention of the CCTV operators resulted in arrest, and these are also shown in tab 8. Most of these relate to property crime. During the 32 month period examined, 18 incidents resulted in arrests for property offences and 5 incidents resulted in arrests for public disorder offences.

The effect of the cameras on recorded crime in King's Lynn

The following analysis examines the number of recorded crime incidents for the period covering February 1991 to October 1993 for 5 different types of offences. For ease of evaluation the impact of the 19 car park cameras only will be considered. It was possible to break down the crime figures into three discrete areas which allowed a detailed analysis of the effect of the cameras on recorded crime: the car parks and surrounding streets that had CCTV coverage, the rest of the division and the rest of the Norfolk Constabulary area.

The figures displayed here examine quarterly moving average figures for the areas specified above. Quarterly figures were chosen in this case because of the low levels of crime in the area covered by cameras, a point that is well worth baring in mind throughout the discussion of these charts. For ease of presentation, the figures also show two different Y axis scales with the left axis providing the scale for the CCTV area and the right axis the scale for the rest of the division and the rest of the force. Moving averages were used so that overall trends would be easier to discern. Because crime figures for CCTV area were so low, it is not possible to assess with any certainty whether or not crime displacement has taken place. The CCTV cameras were installed an dwent operational within the same quarterly period.

Figure 27 Trends in recorded crime figures for theft from vehicles in King's Lynn and surrounding areas, February 1991 - October 1993

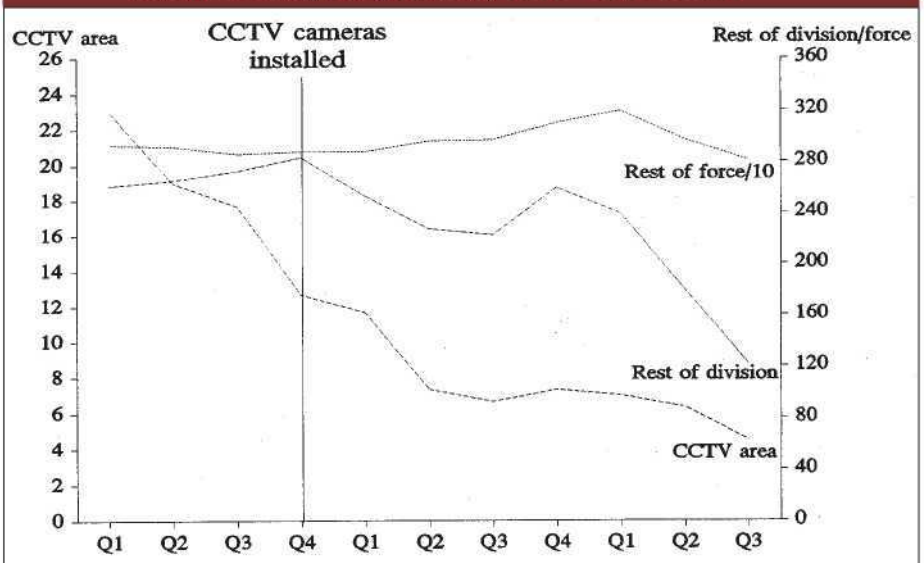
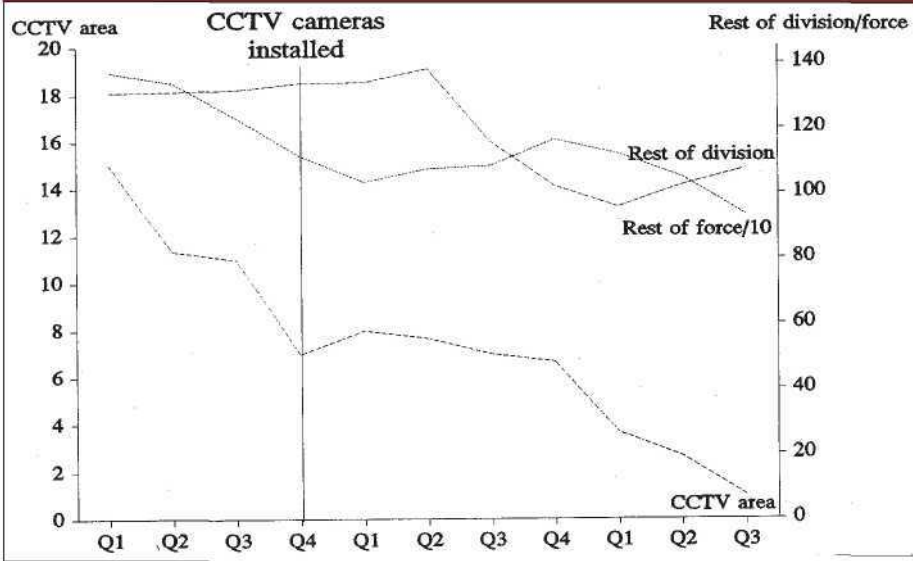


Figure 28 Trends in recorded crime figures for theft from vehicles in King's Lynn and surrounding areas, February 1991 - October 1993



As figures 27 and 28 show, the incidence of vehicle crime has reduced significantly within the CCTV area since cameras were installed. However, vehicle crime in the CCTV areas was reducing before the cameras were installed making it difficult to be certain about the contribution of the cameras to the continuing reduction. It is important to recognise, however, that theft of motor vehicles has reduced to virtually zero per quarter which is a significant achievement.

The incidence of burglary (both domestic and other) has shown a sharp decrease in the area covered by cameras while increasing in both the rest of the division and the rest of the force (see figure 29). The number of recorded incidents of criminal damage also decreased sharply after the installation of cameras (see figure 30). There is evidence to suggest that the effectiveness of the cameras in tackling criminal damage, and to a lesser extent burglary, began to fade 12 to 15 months after the cameras had been installed. The number for both types of offence began to rise after this length of time despite decreases in the other areas examined.

Figure 29 Trends in recorded crime figures for burglary in King's Lynn and surrounding areas, February 1991 - October 1993

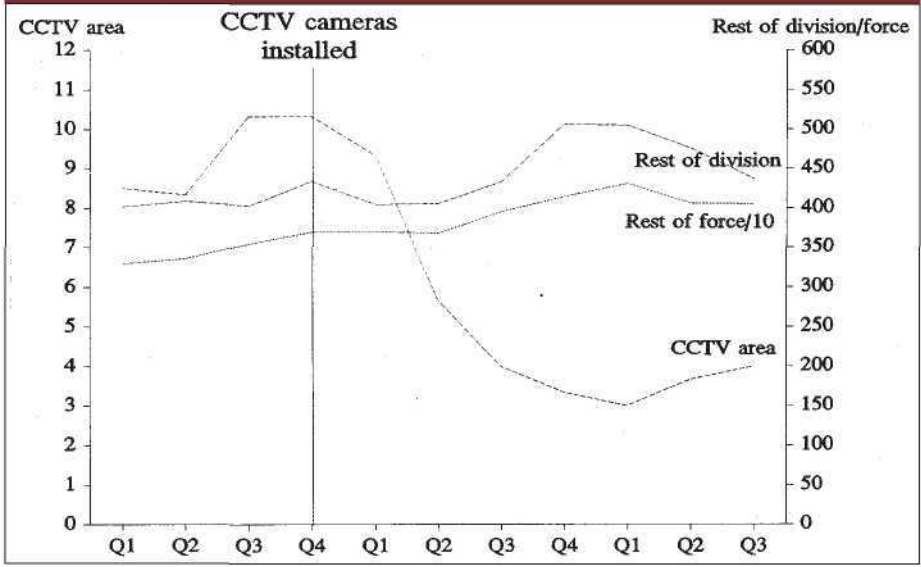
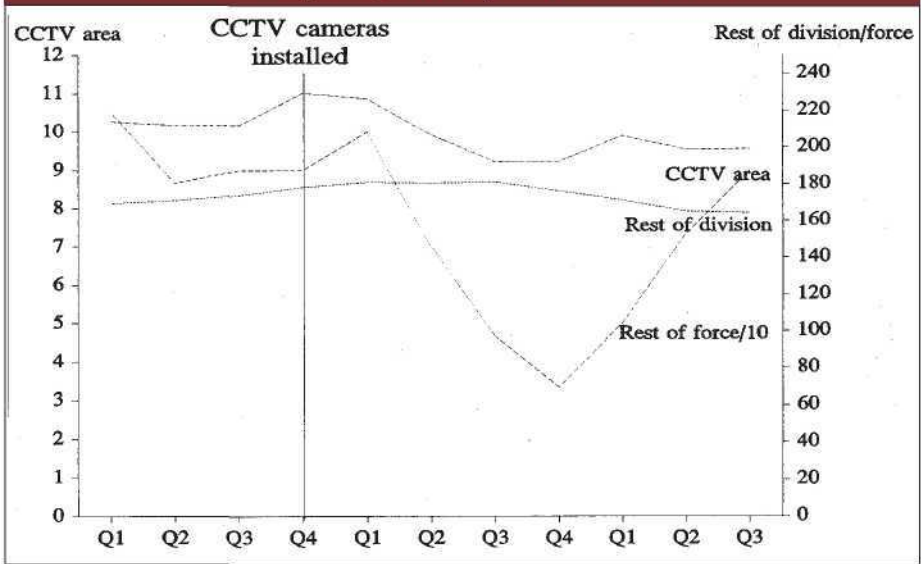
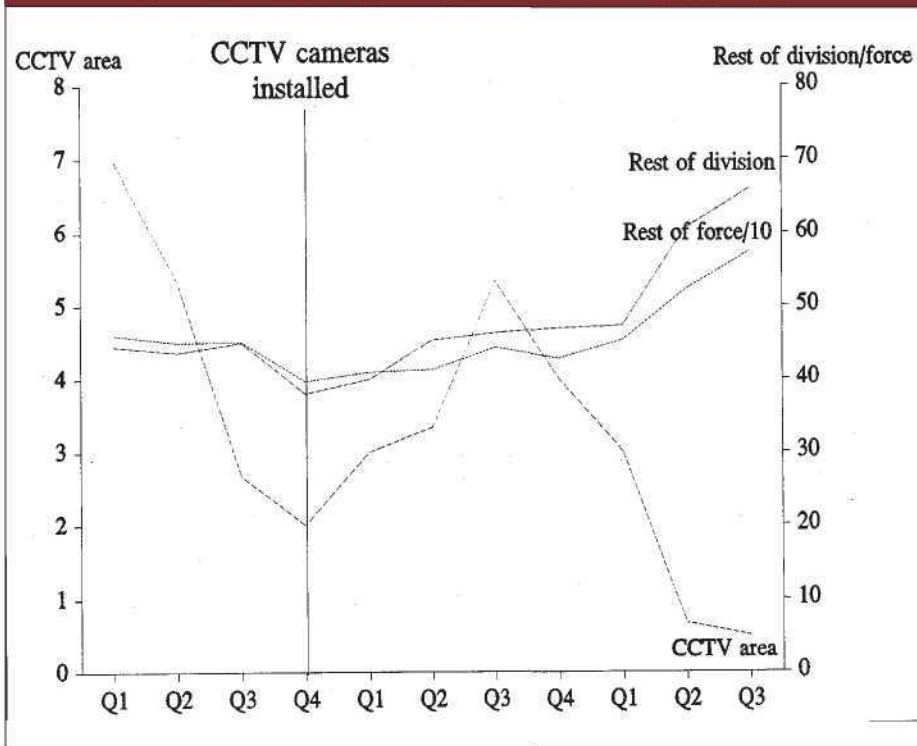


Figure 30 Trends in recorded crime figures for criminal damage in King's Lynn and surrounding areas, February 1991 - October 1993



The figures for wounding and assault show a very interesting pattern, but it must be remembered that the numbers for these types of offence are very low (see figure 31). One year before the installation of cameras the figures for the CCTV area show a sharp downward trend. However, during the following nine months, there is a sharp increase in the number of offences in this area. This is then followed by another sharp decrease in the number of offences, despite the steady rise in the number for the other areas examined. This suggests that the presence of cameras is bringing more of these incidents to the attention of the police which subsequently leads to an increase in recorded incidents in those areas with camera coverage. It is only after this increase that the number of offences starts to decrease. This may be due to the fact that the effectiveness of the system in dealing with these types of offences has been demonstrated which has then acted as a deterrent to potential offenders. Alternatively, the improved response made possible by the presence of cameras means that the police have become more effective at defusing situations which previously may have resulted in a wounding or assault offence.

Figure 31 Trends in recorded crime figures for woundings and assaults in King's Lynn and surrounding areas, February 1991 - October 1993



Conclusions

There is evidence to suggest that the use of cameras within King's Lynn has reduced the incidence of various types of offences, most notably burglary, but to a lesser extent assaults and possibly vehicle crime. The fact that the cameras have been involved in over 80 arrests for property offences and almost 100 arrests for public order offences reinforces the point that it is action precipitated by cameras that has led to these effects.

The findings illustrate the extent of surveillance that CCTV systems can provide in towns like King's Lynn. Operators noticed over 2000 incidents in a 32 month period, of which only 16 percent resulted in police officers contacting a suspect. In most of these cases, the police chose not to respond. There were also a similar number of incidents where the movements of people were monitored at the request of staff from other agencies.

The results also illustrate how useful the camera system can be in helping the police carry out their day to day duties. Demands on the police are considerable but officers are often alerted to many incidents where a police response, especially an immediate police response, is inappropriate or unnecessary. Moreover, by the time many incidents come to the attention of the police, they cease to require a police response. The following quote from Waddington (1993), taken from his survey of calls to the police, illustrates this point well:

Taking all calls together, the most likely outcome is that when the patrol arrived it found nothing requiring recorded police action. Twenty nine percent of all calls resulted in patrols making an 'area search' but found no trace of the incident or person, or found that the person, vehicle or whatever 'left prior to arrival' or that the situation was 'all in order'. This is strikingly similar to the 31 percent of 'incidents' in Ekblom and Heal's survey which they felt 'could be considered to be a waste of police time' (Ekblom and Heal, 1982). (page 38, Waddington 1993).

In an environment such as King's Lynn, the cameras were very helpful in determining whether an incident required a police response and what that response should be. In this respect, the system helped manage police resources more effectively.

The findings reinforce the point raised by the Newcastle case study, that the cameras are at their most effective in dealing with crime when they are integrated into a command and control strategy, and are used to discover incidents and co-ordinate an appropriate police response. It is often the case that incidents occur within range of the cameras but are not noticed by operators. In these cases, investigating officers may view tape recordings of the area where an incident has taken place. Although these tapes are viewed regularly during the course of an investigation, they only provide useful information very occasionally.

CONCLUSIONS

6. Conclusions

The police use of town centre CCTV systems

The police use town centre camera systems in number of ways to tackle criminal and anti-social behaviour. The primary use of camera systems within town centres is as a tool to 'patrol' these areas effectively and discover incidents as they occur. The police use the information provided by the cameras to coordinate suitable responses to these incidents, whilst gathering evidence that can direct the investigation of an offence and secure the swift conviction of an offender. Although camera footage is used in helping to detect an offender after an event has occurred, this is a less common and less effective way of impacting on crime.

Overwhelming evidence from the case studies indicates that cameras are used most often to deal with conspicuous anti-social and criminal behaviour, most notably various small scale public order problems, ranging from unruly nuisance behaviour to fighting and assaults. Even though many of these offences may appear trivial in nature, they can be a significant problem for town centre management. If problems such as littering, vandalism and loitering within town centres are not tackled responsibly and effectively, they may get worse. A town centre may then be perceived as dirty and/or dangerous which, in turn, not only deters legitimate users (URBED 1994) but may also attract potential offenders (Kennedy, 1990; Murray 1983). It is also important to remember that a significant minority of arrests attributable to the camera systems relate to other types of crime such as robbery, theft and burglary.

The information provided by camera systems is also very useful in helping the police to manage their resources more effectively. Almost one third of all calls to the police are false alarms (Waddington, 1993 and Ekblom and Heal, 1982). Camera systems, therefore, can give some indication as to whether or not a police response is required at all.

The effect of cameras on offending within town centres

Property crime

The findings from the case studies indicate that CCTV camera systems can help reduce the incidence of property crime within town centres. In Newcastle and King's Lynn, and to a lesser extent Birmingham, property crime has reduced *in those areas covered by cameras*. This refers mainly to the burglary of shops, but also to theft of and from vehicles.

The evidence from the Newcastle and King's Lynn case studies suggests that initially the presence of cameras deterred all the types of property crime examined. It also appears that the effect of the cameras on some of these crimes may have faded over time to a certain extent. Within the time period examined, however, there were net reductions in these offences in areas with camera coverage.

What appears to be the important factor in sustaining the effect of cameras on property offences is that the risk of arrest for these offences is increased. In Newcastle, for those offences where there is evidence for a sustained effect, the risk of arrest has increased. This suggests that the presence of cameras within an area may initially deter criminal behaviour, thus accounting for dramatic reductions in crime often observed and widely publicised for schemes around the country. What sustains this effect, however, is a real increase in arrest rates for certain offences.

It is also interesting to note that in Newcastle there is no evidence which indicates that property crime has been displaced, either by location or offence type. In fact, it appears that there may have been some diffusion of benefits.

Personal crime

The effect of cameras on personal crime is less clear. In the large metropolitan districts, the cameras seem to have had considerably less impact on overall levels of public order and assault offences. Within King's Lynn, a smaller market town, there is evidence to suggest that cameras have reduced assaults in those streets covered by cameras, but the numbers of incidents are small and this reduction occurred after the cameras had been operational for some months.

The benefit of the camera systems in dealing with offences such as assault, however, may lie less in their deterrent effect but more in the way they help officers deal with such offences. Camera systems can benefit police officers in dealing with assaults and disorder in two ways. First they can help to co-ordinate a quick and effective response which may reduce the seriousness of the incident. Secondly they can be used to gather evidence that might be used in the investigation of an offence and the swift conviction of an offender. Such evidence might be otherwise difficult and resource intensive to collect. In areas such as King's Lynn, where these types of offences are relatively rare and where resources are less stretched at the relevant times, the incidence for these types of offence may eventually decrease in areas covered by cameras.

CONCLUSIONS

The presence of CCTV cameras within the study areas has had little overall impact on the incidence of robbery and theft from the person. The rates for these types of offence did not decrease after the cameras were installed in either of the two areas where these types of offence were examined. However the findings from the Birmingham case study suggest that the cameras have helped to *contain* the problem of robberies and personal thefts within an area, possibly by reducing their incidence in areas where there is a good camera view. The fact that the system in Birmingham has led to the arrest of offenders for these types of offences supports this notion. However, it seems as though these offences are more easily displaced to town centre areas/streets that are not covered by cameras, but are still routinely used by members of the public.

The displacement of crime is a major issue in the evaluation of any situational crime prevention measure. It is very difficult, especially using quantitative crime data, to identify displacement correctly. To identify displacement (or even the effect of cameras on offending behaviour) using these data, one has to infer the intentions and beliefs of offenders (Gabor 1990).

There is, however, evidence to suggest that some displacement of crime has taken place. The findings suggest that the likelihood of crimes being displaced by the cameras depends on the nature of the offence, the type of area the cameras are located in and the extent of the camera coverage within this area. Personal crimes such as robbery and theft from the person appear to be more difficult to control using cameras than property crimes, and therefore are more easily displaced. This may be because the number of 'suitable' victims is greater than for property crime, especially in locations where the town/city centre extends beyond the area covered by cameras and the layout is complex.

As evidence of this, some displacement of robbery and theft from the person seems to have occurred in Birmingham. In this location, the city centre area extends into a neighbouring police division, well beyond the area covered by cameras. There are many places within the town centres that have no camera coverage but are still used by potential victims; consequently offending may move from those areas that have coverage to those areas where there is partial or no coverage. Moreover in Birmingham; as crime has been displaced to different areas, it has manifested itself in different forms, especially theft from vehicles.

Property crime on the other hand, is easier to control using cameras and because of its nature is less likely to be displaced within town centres. Furthermore, where the extent of camera coverage within a town centre is

high, there may be some diffusion of benefits to areas that immediately surround the town centre, as seems to be the case in Newcastle.

The implications of these findings are that in order for a camera system to be effective within a town centre, there needs to be a high degree of coverage. There is also no guarantee that acquisitive personal crimes such as robbery will not be displaced to surrounding areas, especially if these areas are routinely used by both potential victims and motivated offenders. If a town centre area has many side streets and other premises such as car parks, it will require many cameras and several operators to make such a system effective. This has obvious resource implications. As mentioned above, however, the cameras can in some instances liberate resources by cutting down considerably on the number of false alarms that police patrols are required to attend.

A number of issues also emerge from this and other studies which have looked at the effect of CCTV on crime. The first is that CCTV seems to work best when it is part of a package of measures, which in this case is a general command and control strategy. With packages of measures it can be difficult to separate any individual element and point to it as a source of success, and so in this case simply installing cameras is no guarantee that crime will reduce in the long term. What is important is the way in which CCTV is used as part of an overall strategy for policing town centres. Secondly, as is common with many crime prevention efforts, the effectiveness of packages that include CCTV may wear off over time. In order to sustain an effect, the cameras must play a part in the apprehension of offenders, and other conditions must be altered to improve the potential of CCTV to have this effect. Camera successes can then be publicised, reinforcing the message for offenders that there is an increased risk of being caught.

CONCLUSIONS

Public support for CCTV

Honess and Charman (1992) found that the vast majority of people support the use of CCTV to control crime in public areas. There is also some evidence from the Birmingham case study that CCTV has helped to improve feelings of safety in the city centre streets after dark. However; Honess and Charman also found that one third of people were concerned with "being watched" and the possible expansion of state or police control. There is no doubt that the presence of so many cameras does represent a significant increase in the degree of surveillance in people's daily lives. It is important to ensure, therefore, that public support for CCTV in town centres is not taken for granted. In particular, it should be recognised that any abuse or perceived abuse of CCTV may affect public support for these schemes. People are mainly concerned about who is responsible for controlling the systems and the way in which the systems are used (Honess and Channan 1992). In this sense, these concerns are less about the cameras *per se*, and are more about the impartiality and accountability of the people and organisations using these systems, and how they are using the information they are getting.

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