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National evaluation of CCTV: early findings on scheme implementation – effective practice guide

Scarman Centre National CCTV Evaluation Team

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National evaluation of CCTV: early findings on scheme implementation – effective practice guide

Scarman Centre National CCTV Evaluation Team

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Introduction

The Home Office CCTV Initiative is part of the Government's Crime Reduction Programme. The aims of the Initiative are:

- To help local crime and disorder reduction partnerships (CDRPs) deploy CCTV in areas identified in local crime audits as having significant crime and disorder problems.
- To help to develop the knowledge base on how CCTV can most effectively contribute to reducing crime and disorder.
- To support the delivery of local crime reduction strategies and to help towards the Government's overall aim of reducing crime and the fear of crime, and the specific target of reducing vehicle crime by 30 per cent by 2004.

A total of 684 public space schemes totalling £170 million are being funded. The main areas covered by successful bids are town centres/shopping centres, car parks, residential areas, community shopping areas, hospitals and rail stations.

The following report identifies the early lessons to be learned from the implementation of 17 CCTV projects funded under the Initiative and selected to cover a variety of contexts including residential areas, town centres and other public spaces. Its aim is to assist practitioners setting up similar projects for the first time. At the time of writing, projects are at different stages of implementation, ranging from the early stages of system design to, in a few cases, the operational stage. Thus these are initial findings.

Home Office Development and Practice Reports draw out from research the messages for practice development, implementation and operation. They are intended as guidance for practitioners in specific fields. The recommendations explain how and why changes could be made, based on the findings from research, which would lead to better practice.

Executive summary

Seven key aspects of implementation have been identified. These are as follows:

- The pre-bidding process
- Project management
- Building a project team
- Engagement of stakeholders
- Third parties
- Identification of costs and resources
- Design and technology

The pre-bidding process: Prior to bidding, project personnel would be expected to have identified relevant local context, crime and disorder problems, analysed them, and devised an appropriate solution. What happens in practice is crucially influenced by a number of factors, including the motivation for applying for funding, the means by which the implementation area is identified, and the understanding of how CCTV may address the problems in the area.

Project management: As with any project, the management of a CCTV scheme is central to its implementation. This report explores the process of decision-making, including the decision-making structures, the determining of priorities and the mechanisms of accountability. In addition, it identifies the effect that the transfer of ownership could have on implementation.

Building a project team: CCTV schemes require a high level of expertise because of their dependence on technology. This report investigates how the project team identifies and uses technical expertise in order to achieve its aims, and

how prior experience and the motivation of personnel can have an impact on the system design. Further, it indicates the procedures which must be in place to ensure a successful transition in the event of staff turnover.

Engagement of stakeholders: Stakeholders may have a role in scheme design and influence the implementation process. In practice, stakeholders most commonly play a role when: they have initiated the scheme, the lead partner agencies attach great importance to their role, or their participation is necessary for the acquisition of resources. The report investigates how stakeholders are identified and the relative effectiveness of methods used to engage them.

Third parties: Parties outside the main partnership often play a crucial role in implementation. For example, their co-operation or consent may be required. This chapter discusses the nature and implications of third party involvement.

Identification of costs and resources: The effectiveness of CCTV schemes depends upon the ability of the project personnel to raise revenue so that the scheme can be continued and remains sustainable. Three sources of funding have been identified in the projects, including partnerships, commercial concerns, and the recipients of the CCTV scheme. The report investigates the issues relating to, and sustainability of, each type.

Design and technology: Implementing a CCTV scheme raises a number of specific problems. For example, physical barriers can impede implementation and the choice of technology will make a significant impact on the final effectiveness of the scheme.

The pre-bidding process

- Motivation for bidding
- Identifying intervention areas
- Changes over time
- Identifying CCTV as an appropriate crime prevention mechanism
- The problem of providing supporting evidence
- Transferable lessons

The success of a scheme can be determined as early as the pre-bid stages, when the motivation for the acquisition of CCTV develops, the intervention area is identified, and the capital costs are calculated.

Motivation for bidding

It might be expected that partnerships would have an area with crime and/or disorder problems in mind when proposing to put a crime prevention 'solution' in place. However, this is not necessarily what happens. Many partnerships view CCTV as a desirable, if expensive, improvement to any area and once funding becomes available a partnership may attempt to identify a location with a crime problem that meets the funding criteria. This form of motivation will mean that any impacts, given that an area may not have had problems in the first place, may be extremely difficult to measure. Similarly, partnerships may face pressure to implement CCTV in areas where communities 'shout the loudest' and may again find it difficult if they respond to this pressure to evaluate any impact of their schemes. However, it is unlikely that partnerships would be successful in their bids if they could not present crime data to support their case.

It should be noted that from 1 April 2003 new arrangements for the management and administration of crime reduction funding, a single funding stream to include CAD (Communities Against Drugs), SCI (Safer Communities Initiative), PDF (Partnership Development Fund) and some DAT (Drugs Action Team) are under consideration. CDRPs will be allocated monies according to a formula. There will no longer be a bidding process for CCTV funding and it will be for CDRPs to decide how the money will be spent on crime reduction interventions which may include CCTV if appropriate.

Identifying intervention areas

The Home Office has provided guidance for statutory partnerships that indicate the criteria for selecting intervention areas (1999, CCTV Initiative Application Prospectus, section 4.3). The guidance states that partnerships must paint "a clear and detailed picture of the crime and disorder problem to be tackled, set in its local social and physical context". Furthermore, "the cause of the problem and/or risk factors for offending [must] have been established, as a basis for designing the intervention". The specific problem of providing evidence that these criteria have been met is discussed below.

Changes over time

Given the time taken to formulate a solid bid, and then to consider bids, partnerships are liable to be faced with changes in both area and crime trends. To avoid such occurrences, the most detailed knowledge of the area and probable future developments is essential. Approaches such as the use of mobile or redeployable CCTV should be considered where appropriate.

Identifying CCTV as an appropriate crime prevention mechanism

The Home Office guidance for partnerships (Home Office 1999, section 4.3) sets out the criteria for identifying a relevant crime prevention mechanism. The guidance states that "the intervention [must follow] from theoretically sound crime reduction principles which suggest plausible causal mechanisms by which it could work against the current crime or disorder problem in the current context". In addition, "the intervention [must be] supported by reliable evidence of its (cost-) effectiveness and sustainability, which can plausibly apply to the current crime or disorder problem".

Sound reasons for the use of CCTV in tackling specific crime and disorder problems can usually be hypothesised. However, it is noticeable that for the most part the personnel involved in the partnerships under study express only a generalised view of the way in which CCTV ‘works’. When project officers are asked how they think the introduction of CCTV will be beneficial to an area, a very common response is ‘it will reduce crime and disorder’. This is not to say that the majority of officers blindly believe that CCTV is a panacea for crime prevention, but that the mechanisms by which CCTV may be expected to reduce crime are not readily identifiable by all the staff members responsible for project planning and implementation.

Projects should reflect a precise idea of how CCTV should work in a given situation. This will influence the design of the CCTV system as the type, dosage and positioning of cameras should reflect the nature of the crime problems in the area. Although few project personnel may have developed an understanding of these mechanisms to the degree advocated by Pawson and Tilley (1997), in many cases there is sufficient local understanding for cameras to be placed in recognised hotspots to tackle specific crime and disorder problems (see PSDB Operational Requirements: www.crimereduction.gov.uk).

Cost-effectiveness and sustainability

Given the current paucity of evidence as to the cost-effectiveness of CCTV as a crime prevention mechanism, it is reasonable that partnerships have not provided a great deal of evidence on this subject. However, in so far as partnerships will be responsible for revenue costs for many years to come, it seems surprising that this issue has not been taken more seriously. The issue of sustainability is addressed in the chapter on the ‘Identification of costs and resources’.

The problem of providing supporting evidence

Partnerships are required to provide evidence for an identified crime or disorder problem in an intervention area, as well as the probable effectiveness of CCTV as a solution. This task is challenging and this report has identified two particularly significant problems.

Data analysis expertise

Only a few of the project bidding teams under study included a staff member with knowledge of statistics and data analysis. A hard-pressed police or council data analyst was often required to provide a set of figures in response to bidding requirements rather than he or she being consulted about which types of data might provide meaningful information.

Availability and quality of data

Partnerships commonly make use of a fixed range of data sources. Each of these has weaknesses. While a variety of agencies are currently working to improve the data available¹, existing shortcomings in this area should be noted.

- **Police crime data:** It is widely recognised that these measure ‘real’ crime levels inaccurately owing to the low levels of reported crime, especially in the case of crimes such as rape and domestic violence.
- **Public attitude surveys:** Surveys of public attitudes (perhaps especially fear of crime surveys) undertaken by local agencies are, in a number of cases, inadequate for the task of eliciting the views of as many members of the communities involved as possible. For example, reliance on postal surveys rather than door to door surveys may result in a low response rate and often there are insufficient statistical checks to ensure that the data is reliable and valid.
- **Crime and disorder audits:** These audits are generally a combination of police crime figures and public attitude surveys, both of which have been shown to be problematic sources of data. The smallest unit to which audit data is disaggregated is the ward, thus rendering their use for smaller area analysis difficult.
- **Index of multiple deprivation:** These deprivation figures are also disaggregated down to ward level and so small areas of deprivation within wards can be ‘hidden’ if other parts of the ward are more affluent.

Transferable lessons

- Careful consideration should be given to the reasons for wanting CCTV. If the justification is not strong at the beginning, as may be the case when areas are identified ‘to suit’, then the commitment of those who are charged with implementation will often be lacking. Thereafter impacts will be hard to identify or evaluate.
- When considering which type of crime prevention mechanism to use, it is important to be clear about the problems in the area and specific about the capabilities of a CCTV system to address them. If the two do not correspond, CCTV is not the right solution.

1. For example, the Office for National Statistics, the Police Crime Recording Agency, the Home Office, the Census Bureau, ODPM.

- Some projects and communities are successful in achieving funding because they are vocal and skilled at getting themselves heard. Others, who may have more pressing crime and disorder problems, may not achieve success in attracting funding as they are not as outspoken. The bid should be thought through carefully and should highlight the underlying problems for which CCTV is a proposed remedy and the reasons why it is likely to be successful. It is the role of the CDRP to review crime reduction in their area strategically.
- Expertise is needed when identifying a problem and the ways in which it can be handled. When gathering data to be used in a bid, the pitfalls with regards to the validity and reliability of a number of sources must be kept in mind.
- It is important to ensure that schemes are not being implemented to address what may be transitory problems as CCTV installation involves significant investment and ongoing costs. Between bid and implementation the incidence of crime may fluctuate and other changes such as town centre developments or other regeneration projects may lead to changes which mean a fixed CCTV scheme may not be the best option.
- If the mechanisms behind CCTV are not fully understood, the design and implementation may not be the best for achieving the intended goal. Project personnel should have a precise idea of how CCTV should work in a given situation. The type, dosage and positioning of cameras depend upon the nature of the crime problems in the area (see PSDB's Operational Requirements Manual: www.crimereduction.gov.uk).
- The capabilities of CCTV should not be exaggerated. Ideally, for each problem identified in an area, a plausible explanation for how CCTV will deal with the problem should be identified.
- Consideration must be given to the cost-effectiveness of any scheme, especially as the partnerships are responsible for revenue costs for its duration.

Project management

- Decision-making processes and structures
- Defining areas of responsibility
- Determining relative priorities
- Establishing the process of accountability
- Potential risks to effective project management
- Transferable lessons

Managing a project within a partnership context can present particular difficulties. The different cultures and ways of working which exist within different partnership agencies can cause obstacles to co-operation, (Crawford (1997)).

However, successful partnership working and project management can be achieved and indeed discussion and debate may assist effective implementation by preventing “single-track thinking” and promoting a wider view. This may slow down the implementation process but proper project exploration will result in a more effective end product.

Local structures for managing CCTV projects vary and it is too early in the national evaluation for a ‘best’ approach to have been identified. However, several factors appear to be influential in the early stages of CCTV projects and good practice in these has been identified.

Decision-making processes and structures

Key decisions made during the design and implementation of a CCTV scheme must reflect the appropriate views and needs of all parties involved if the scheme is to meet its objectives. To facilitate inclusive and effective decision-making the following points should be borne in mind:

- Where one or more agencies (by virtue of being the primary funder or having expertise for example) operate as ‘lead’ agencies, the extent to which they may lead or impose their preferences upon the other agencies should be established early in the process.
- Other relevant parties such as technical advisers and stakeholders should be identified and the occasions when their input is vital for decisions should also be identified and agreed.
- Individuals with the authority to make decisions should be identified and incorporated within this process and such individuals should acknowledge their role and exercise their authority accordingly.

- Lines of decision-making should be established, agreed and understood by all partners at the beginning of the process.

Problems can quickly arise if a partnership fails to vest authority in relevant people and institutions, or where those with authority are unwilling to use it.

Types of decision-making structure

The effectiveness of this process also depends on the structure that is in place for making decisions. Within the projects under evaluation three main types of decision-making structures have been identified:

Informal decision-making

Many projects have an informal decision-making structure (so no process is written down or established policy). Typically in these cases one or more people hold the decision-making power and will manage the CCTV implementation process. This approach when successful is characterised by a clear demarcation and understanding of roles and responsibilities amongst the project team. When an individual makes decisions they are reported back to a management team or steering group for approval. The latter then becomes a reporting rather than decision-making body.

The advantage of this method is that each individual understands his or her role and the objectives of the project. This approach allows decisions to be made quickly when necessary but it can lead to a lack of accountability. Other problems can occur because:

- Management groups have insufficient opportunity to scrutinise decisions made, especially if meetings are infrequent, too short, or key staff do not attend or lack expertise. This can result in ‘rubber-stamping’ by the committee.
- There is less sense of collective ownership. *A Practical Guide to Crime Prevention for Local Partnerships*

(Home Office, 1993 p4) recommends that “a sense of collective ownership needs to be developed.” A lack of involvement in making important decisions, or the opportunity to scrutinise decisions, can alienate partners and reduce their sense of ownership which may impact negatively on the scheme.

Formalised decision-making

A minority of the schemes evaluated have a fully formalised and democratic decision-making structure. Such systems encourage transparent, accountable management styles whilst ensuring all partner agencies have the opportunity to take part in the decision-making process. A disadvantage, however, is that decisions can be made only at meetings and if these are infrequent this can delay vital decisions and in turn delay implementation.

Informal combined with formal decision-making

The research so far indicates that the most effective decision-making structures combine informal, autonomous decision-making with more formal, democratic procedures: individual expertise and responsibility is recognised and there is a degree of independence for more routine decisions but strategic decisions remain the responsibility of the partnership. The effectiveness of this type of structure is increased if steering group meetings are held frequently enough to enable active discussion of current relevant issues.

Defining areas of responsibility

Central to an effective decision-making structure is the clear demarcation of individual and agency responsibilities within the project. This demarcation has to be clarified and agreed to at all levels of activity from the operational to the strategic. The earlier this is approved by the partnership as a whole, the more effective the decision-making appears to be and the more smoothly the project is implemented.

These points are equally as important in the case of contracted-in personnel and third parties. The more clarity and attention to small print within contracts with consultants and service providers the less likelihood of delays and problems arising as a result of not knowing what parties are responsible for.

Determining relative priorities

As with responsibility, the earlier the priorities and the relative importance assigned to the project by partner agencies is established, the smoother the implementation of the project appears to be. Even if there is conflict due to

differing priorities as partner agencies share and overlap as regards organisational goals and internal priorities, implementation tends to be less problematic, although it is too early to say ‘better’.

Establishing the process of accountability

For a scheme to be implemented effectively, accountability and mechanisms for identifying the party or parties accountable need to be in place and clearly defined. There are two main elements to these mechanisms:

- There must be opportunities to establish whether commitments have been fulfilled.
- Relevant parties must have a way to enforce performance in the event of a failure.

Agencies and individuals, as well as the partnership as a whole, can be held accountable by a variety of bodies. The three most common types of accountability are: accountability to partner agencies, accountability to fund-holders and accountability to stakeholders. The exact means by which these individuals and agencies are accountable to others should be established and an agreement made between all parties.

Potential risks to effective project management

Two further risks to effective project management have been identified. The first of these occurs when management of a project changes from one agency to another. The second occurs when there is over-reliance on limited resources.

Transfer of management

During the course of project development and implementation it is possible that the lead agency will change or a key individual move. This process need not cause delays and problems if a partnership is fully functional and other agencies and individuals know when and how to ‘pick up the reins’. However it is not always easy to achieve a smooth transition. Obviously, problems arise if an individual or agency is not primed to take on the new responsibilities immediately, and this links to the following.

Over-reliance on limited resources

In a number of areas, the responsibility for project management or other specialised tasks rests in the hands of a single individual or small team. This means that even one person’s absence (as a result of illness for example) can delay the entire project and problems are even more likely if personnel move from the project completely without a sufficient hand-over to a replacement.

Both the above cases demonstrate how important it is to keep good written records of project progress and ensure that key staff brief other partnership members on progress and problems.

Transferable lessons

Decision-making

- Decision-making processes must identify lead agencies, involve all relevant parties, and be clearly understood by all concerned. All people or agencies with the decision-making powers necessary for project implementation should be identified.
- Informal decision-making structures, where individuals are given the responsibility to report to the executive for brief scrutiny rather than extended discussion, allow rapid progress in implementation. However, meetings must be held often enough to maintain partnership engagement and avoid a tendency to 'rubber-stamp'.
- Formal decision-making structures allow greater accountability but may impede implementation as decisions cannot be made between meetings. Thought must therefore be given to the frequency and core attendance required at steering groups.
- Division of responsibilities should be transparent and agreed by all partners.

Determining priorities

- Establishing priorities can generate conflict but discussion should be encouraged as it can avoid single-track thinking and lead to the identification of problems beforehand. This leads to a better end-product.

- Implementation is smoother, although not necessarily better, when agencies have, or establish, the same organisational priorities. Thus, there is a potential trade-off between speed of implementation and a scheme which fulfils all its objectives.

The process of accountability

- Early identification of the patterns of accountability between relevant parties will facilitate project implementation and management. Relevant parties include partner agencies, all contractors and consultants and the recipients of CCTV.
- Attention should be paid to the detail in all contracts with consultants and contractors and mutual understanding of respective accountability agreed at an early stage.
- Accountability is easier to identify and enforce when roles and responsibilities are clearly established.
- Accountability to partner agencies is assisted where a formal decision-making structure is in place.

Potential risks

- Priorities and accountability must be re-established and agreed when ownership of projects change.
- Where possible, develop 'back-up' systems for vulnerable but significant parts of the project where one or a few key individuals are relied upon. Good written records of all decisions throughout the process are invaluable.

Building a project team

- Expertise
- Motivation
- Relationships and continuity
- Transferable lessons

Expertise

The need for expert technical knowledge

Given the context of continuing technological development, early findings, unsurprisingly, suggest that the successful design of a CCTV scheme requires expert technological knowledge. This differentiates CCTV schemes from other potential crime prevention measures. Partnerships are aware of this and will bring in external expertise if they do not have it internally, typically in the form of a consultant. Some partnerships employed a mixture of internal and external expertise, which brings particular benefits as discussed below.

Sources of internal expertise

Technical CCTV expertise is often held by individual partner members from within the police or the local authority. Other partnership members can leave the project design in their hands, assuming that as members of the partnership they are conversant with the aims and objectives of the scheme. Thus they implicitly presume that they will choose the most appropriate equipment and the best camera locations. This is not necessarily true, however. In contrast, partnership members typically communicate with external experts to a greater degree, assuming that someone from outside the partnership area will be ignorant of local needs and issues.

Where internal expertise is not available, a member of the partnership team can be designated to acquire it, but time spent on training and learning must be built into project plans and should not be underestimated.

Combined expertise

Where internal knowledge exists this can facilitate good communication of project plans if and when external knowledge is brought in. It may also mean that the monitoring of implementation and difficulties will be easier for the partnership. Where there is no internal source of

expertise, a partnership may well be unable to judge the recommendations that an external expert makes and once again training will be helpful here.

Limitations of external expertise

Whilst many technical consultants will have a vast knowledge of the different camera types, transmission methods and ergonomic design features for control rooms, not all consultants will be equipped to deal with the implications for project design of digital technology. Project personnel must ensure they speak to several experts or consultants before contracting the work. Digital technology is a recent innovation for CCTV and the quality of consultants will vary in terms of their knowledge about its capabilities and weaknesses. Speak to other projects about recommended consultants or contact PSDB via the crime reduction website (www.crimereduction.gov.uk)

Motivation

CCTV schemes require extensive planning and the installation of technology and implementation of structures takes time. Therefore problems are bound to occur at some stage. This often occurs when input from third parties is necessary, such that negotiation is required or a time delay ensues. Staff in key positions, who are able to remain committed and creative during long periods when progress is slow, are more likely to keep the project moving forward. Thus the motivation of key staff, as with most projects, appears to be critical. This can result from the anticipated career benefits to the individual or a strong belief in the objectives and aims of the project.

Relationships and continuity

Project implementation is assisted where there is continuity of staff. Long-serving partnership members gain a thorough knowledge of an organisation and its working practices and an awareness of historical events.

Furthermore, they have formed solid relationships with staff in other departments and organisations over time. This aids co-ordination where input is required from a number of different individuals across departments and agencies. This is typical of CCTV implementation.

Continuity of personnel can also facilitate the bypassing of formal administrative procedures using personal contacts. However, formal procedures provide more opportunities for project personnel to detect mistakes or to contribute to scheme improvements. These are lost when the process is bypassed.

Care should also be taken in that whilst familiarity in a relationship can ease communication, it may also bring drawbacks such as complacency or a reluctance to question performance. This may be particularly pertinent when dealing with known consultants or sub-contractors who have a fundamental impact on the implementation of a scheme.

Transferable Lessons

Expertise

- The successful design of a CCTV scheme requires expert knowledge. Project managers should assess and access internal technical expertise early in the implementation process. Internal expertise should be utilised during the recruitment of any external technical consultants.

- Where internal expertise is unavailable, it may be acquired by the partnership through Home Office materials, workshops, CCTV users' fora and visiting successful schemes. However, the time this learning process takes can be considerable and must be built into project plans.
- Project managers should ensure that internal and external experts become familiar with the overall objectives of the scheme. This will assist with the scheme design.

Motivation

- A well-motivated individual is more likely to keep a project on time and "on-track" when faced with difficulties. Paying attention to staff morale is crucial.

Relationships and continuity

- Continuity of personnel, both with and between partnership agencies, can smooth implementation. It allows formal procedures to be bypassed and facilitates timely implementation.
- Whilst familiarity with a service provider, contractor or consultant can facilitate communication, partnerships should ensure that such relationships do not prevent full evaluation of alternatives or lead to a lowering of standards.

Engagement of stakeholders

- Who are stakeholders?
- Transferable lessons

Who are stakeholders?

Stakeholders in a CCTV project are those who may benefit from its introduction and those with a real and practical interest in its success. This will include businesses or agencies that have invested in the scheme in the hopes of reducing crime. Stakeholders do not have an automatic entitlement to be consulted and involved in the design and implementation process, but findings from this evaluation indicate that their early engagement benefits project implementation.

The community as stakeholders

Definition of community

It should be recognised that there are often differences within communities. Employment, housing types, ethnicity, types of crime, and the level of criminal activity are just a few of the possible variables that can characterise 'communities' in different ways (Foster 2002:172). Those who share a geographical space do not necessarily have a shared interest (Foster 2002:173). This problem is exemplified in Crawford's (1997) study of a block of flats, where a CCTV monitor was placed in each flat affording occupants surveillance over the entry point to the block. Despite this, the block suffered a significant number of burglaries. It was later found that the burglars lived in the block and had used the technology to monitor the movements of other residents (Crawford 1997:160).

Approaches to and methods of consultation

Partnerships can be tempted to avoid consultation in order to allow implementation to proceed more rapidly. However, there is evidence that where consultation is ignored or not carried out early enough, more serious problems than delays can occur later in the implementation process.

A 'top-down' consultation method typically involves project planners consulting with the community via residents' groups and other active parties. When the

impetus for a CCTV scheme comes from a community itself the consultation can more accurately be described as 'bottom-up'. Both methods can be susceptible to the problem of excluding sections of the community, although in both cases it is usually the highest-profile or loudest groups who get themselves heard.

Whichever approach to community involvement is taken, partnerships must ensure they reach as many people as they can. Where a survey is used, partnerships must involve a large and representative sample of the community to ensure a minimum response rate is achieved. Effective consultation can be very difficult to achieve if the wrong methods are used and it is another example of an issue which merits expert advice.

The design of the survey questionnaire must be neutral and the questions unbiased. Surveys often ask only whether residents would like CCTV or not. There are a number of difficulties with interpreting positive responses to this question. Respondents might prefer to spend the money on an alternative option, which is not put forward, but accept CCTV because it is 'better than nothing'. There is a skill to research and this is often not recognised until it is too late.

Continuing involvement with the community

The community's involvement must be maintained for the duration of the project. Implementation problems and delays have been experienced by projects whose managers have failed to maintain community involvement.

Local small businesses as stakeholders

In a small number of the projects being evaluated, where CCTV is being installed in city and town centres, local businesses have naturally been identified as stakeholders. However, despite this and despite the pivotal role such businesses will have in the sustainability of schemes, early findings indicate that CCTV project managers are failing to consult effectively with business communities. This

means that they run the risk not only of implementing CCTV systems that do not address all their stakeholders' needs, but also of failing to engage with people whose ongoing support may be important to the success of the schemes in the long-run. Lessons learnt from community consultation can be applied to consultation with local businesses and every effort should be made to capture their views and support. Continued engagement is especially vital if it is intended to supplement revenue costs by contributions from business stakeholders. This latter point is discussed further in the 'Cost and resources' section.

Transferable lessons

- Projects may be tempted to avoid consultation in order to allow implementation to proceed rapidly. However, there is evidence that where consultation is ignored or not considered early enough, more serious delays occur later.
- Only if all elements of the community (including local businesses) are consulted are project planners in the best position to decide: 'is this CCTV system what this community really needs, and will the community support it?' The composition of the community must be carefully assessed and methods of consultation used that ensure their views are captured systematically. It should not be assumed that self-selected groups such as residents' associations are fully representative.
- There is a right and wrong way of conducting research. Professional help should be sought (e.g. through local colleges or universities as well as consultants) when designing and using public attitude surveys.
- Community involvement should be maintained. Ongoing consultation ensures that CCTV schemes meet the demands of the community and can help avoid conflict and delay in the implementation process.

Third parties

- Consent of third parties
- Co-ordinating activity with third parties
- Supply by third parties
- Intentional and unintentional damage by third parties
- Transferable lessons

Throughout the design and implementation process it is likely that partnerships will need to liaise with third parties, that is organisations or individuals outside the partnership. For instance, co-operation will be required from the local planning department when erecting camera poles, but it is unlikely that the planning department will be a partner in the CCTV group. Such interactions are necessary but can introduce an unpredictable element into the planning of a project and need to be managed.

Consent of third parties

Third parties should be brought into the project planning process as early as possible. Thus problems can be identified and any necessary third party input built into the project plan. For instance, such input may be necessary to obtain planning consent for aspects of the scheme.

It is important to identify a contact from within the partnership to liaise with third parties, preferably someone with previous experience of working with them. In projects examined for this report it was notable that, where project managers had not been able to delegate responsibility for contacting third parties and lines of communication were not straightforward, delays in project implementation occurred.

Co-ordinating activity with third parties

In some cases, the CCTV project is inter-linked with another project which is run by or involves input from third parties (this could include use of buildings or other infrastructure). Any delays in that project can impact on the CCTV scheme so co-ordination and inclusion of inter-linked factors in project plans is vital.

Supply by third parties

Suppliers of services, goods and utilities need to be considered as integral to implementation and again

should all be identified and contacted at a very early stage in the project design and planning. This is particularly important given that some suppliers are in effect monopolies (notably telecommunications and other utilities and specialist technology suppliers) which can affect both costs and the timetable of implementation. Delays in obtaining power supplies or equipment have affected implementation in some of the projects being evaluated, but in most cases these could have been avoided if partnerships had brought third parties into the planning and implementation process earlier.

Intentional and unintentional damage by third parties

Vandalism and accidental damage appear to be a common occurrence for CCTV schemes. These incidents have obvious time and cost implications but cannot be predicted. Whilst it is difficult to plan for such eventualities, contingencies such as spare capacity and resources should be built into projects. Discussion about and consideration of worse-case scenarios will help with this process.

Transferable Lessons

- Consultation with third parties should take place early on in the project planning process and needs to be managed throughout implementation. Third parties should be kept informed of progress and plans and representatives of relevant utilities or departments invited to be ad hoc members of management or project planning teams.
- An individual should be nominated to liaise and negotiate with third parties as this will help to ensure that problems are managed in a timely and efficient way.

- Supplier monopoly means that the onus is on partnerships to be timely and specific when dealing with them. Forward planning is vital and suppliers must have timely information about equipment and scheme requirements.
- Scheme managers need to be aware of the possibility of criminal damage and accidental damage to equipment and build-in contingencies.

Identification of costs and resources

- Partnership funding
- Income generation in the commercial field
- Revenue from recipients
- Transferable lessons

The funding criteria for CCTV initiatives under the Crime Reduction Programme allowed claims for capital costs, but revenue costs (e.g. funding for the monitoring, staffing and maintenance of CCTV systems) are a local responsibility. The Home Office provided guidelines to practitioners to aid them in the acquisition of revenue funds and listed a number of possible avenues (Home Office 2001):

- Combining enterprises to reduce cabling and transmission costs.
- Sharing design and installation costs with private sector developers.
- Using spare capacity to monitor business premises.
- Requiring support from licensees under entertainment licensing arrangements.
- Seeking contributions from beneficiaries of the scheme in the public and private sectors.

Partnership funding

Primary agency provision

Funding supplied by the main agency involved in a CCTV project is normally in the form of a direct contribution to the revenue costs. To date this form of income has caused few difficulties amongst the projects being evaluated. It appears that funding is readily available when CCTV is of high priority to the lead agency and that agency has the management capacity and experience to implement CCTV projects. Frequently, such partners are responsible for running existing public CCTV projects in the area. In a number of cases the lead agency is the local authority. However, the extent to which a single agency is able to soak up unpredicted shortfalls in revenue may be critical to the success of a project and funding will not be secure should the agency have a change of priorities.

Secondary agency provision

Funding from secondary agencies (those who are not the main agency but nevertheless play a role in system design and are part of the steering group) may come either through direct contributions or through the integration of more than one crime prevention project. Such integration occurs when one project forms a vital element of another, separately funded project. For example, a regeneration project under SRB (Single Regeneration Budget) may depend on CCTV funded by the Crime Reduction Programme to protect new buildings. Funds from SRB may therefore be made available for the CCTV scheme. The contributions take the form of matched funding. It has been noted that those agencies which have close links with the lead agency and share an objective with that agency are more likely to make direct contributions to revenue income. However, any extra funding secured may have strings attached that may reduce the net gain. For instance, in the case of matched funding, project managers may be required to satisfy specific criteria laid down by funding bodies; this can be both time-consuming and impede the process of implementation.

Projects must take care when 'sharing' CCTV resources that all secondary uses are included in the project profile to ensure compliance with the Data Protection Act in terms of specifying project aims and objectives.

Income generation in the commercial field

In some cases, parts of the CCTV system such as cabling can be leased to local companies in order to generate income for the CCTV project. If this option is to be utilised the CCTV system has to be adjusted and the capacity increased. In some cases this can allow systems to incorporate fibre optic cabling where it would otherwise have used microwave technology. This could have a number of benefits (see 'Design and technology' chapter).

In addition, the benefits of a CCTV system can reach into the community via other stakeholders (e.g. transport companies, schools), without prohibitive costs, especially if the council assumes the monitoring function.

Raising revenue from commercial concerns requires the negotiation of contracts, which is time-consuming. However, there is a degree of risk involved if project development proceeds before these negotiations are complete. There is also the issue of the sustainability of commercially generated funds, where the needs of the leasing or providing agency may change over time.

Revenue from recipients

The beneficiaries of the CCTV projects, for instance residents and businesses, are a potential third source of income. Raising revenue this way requires good consultation with the intended 'clients'. The first stage of consultation should ideally take place prior to submission of the bid and the second following receipt of the funds.

Voluntary contributions from local businesses

In this case the first consultation exercise should be designed to obtain pledges of support. As there is no absolute obligation on businesses to fulfil their promises once the project becomes live, it is important to maintain interest in the project (local press coverage and publicity can help here) and for it to be seen to produce some tangible benefits. It is too early in this study to assess the sustainability of such funding.

Local authority housing rents

In some of the residential areas where CCTV projects are being evaluated, local authorities put effort into seeking the views of the community prior to the bidding process, and explained at this point that one of the implications of installing CCTV in their area may be rent increases. The process of consultation is in reality one of 'selling' the project to the local community and it is vital that project managers do more than just canvass letters of support. They must undertake a genuine consultation to ascertain the views of all sections of the community (Home Office 2001). Otherwise, tenants may not be willing to pay the extra rent.

However, it is important to bear in mind that in areas where there is a transient population, consent may be obtained from residents who may not, ultimately, be paying the increased rent.

Other properties in the area

With both the above methods of raising revenue, non-contributing residents or businesses may gain from the CCTV project. People living in privately-rented or owner-occupied housing, for example, may benefit from projects funded by local authority rents. This could become a political issue and is potentially a very sensitive one. Similarly, non-contributing businesses may benefit from a local CCTV scheme which may cause resentment amongst contributors. Therefore they may contribute only for a short space of time rather than for the five or more years necessary for ongoing monitoring.

Transferable lessons

Home Office guidelines

- The Home Office guidelines for the acquisition of revenue funds for CCTV projects need to be studied and applied wherever possible.

Partnership funding

- A direct contribution from the lead agency in the partnership appears to be the most secure form of revenue.
- Secondary agencies can also provide direct funding but often provide funding for a CCTV project through integration with other projects. There may be potential for CCTV to benefit an existing or future project in order to prompt agencies to provide funds that would not otherwise have been allocated to CCTV.

Income generation in the commercial field

- Elements of a CCTV system, such as cabling, may be leased to local companies as a means of generating income. In some cases, this extra revenue has been sufficient to allow significant increases in the capacity of the system.
- Contract negotiations in such cases are time-consuming, but planners should be aware of the risk of progressing with implementation on the assumption that funding is secure before contracts are signed.
- Projects should ask themselves whether commercially generated funds are sustainable as the needs of companies can change over time.

Revenue from recipients

- Obtaining revenue from beneficiaries of CCTV schemes is heavily dependent on an effective consultation exercise and it is important to ensure this takes place.
- Obtaining revenue from local businesses is a two-stage process: eliciting initial pledges of support and obtaining money or resources; then maintaining that support and the contribution. The CCTV project must be seen to produce tangible benefits to ensure long-term sustainability of these voluntary contributions.
- With respect to increases in housing rents, local authorities should consult with the community prior to the bidding process, and explain the implications of installing CCTV in their area very clearly if this will lead to an increase in rents.
- As there can be a considerable time lapse between receipt of funds and the initial pre-bid consultation, the CCTV project may have to be 're-sold' to residents or businesses to ensure that these costs are planned for.

Design and technology

- Physical barriers to implementation
- Technologies
- Transferable lessons

Physical barriers to implementation

A number of project planners for the CCTV schemes being evaluated reported that they had encountered physical or regulatory barriers that had impeded their scheme's implementation. Barriers could include pavement widths, road closures, tree roots and conservation regulations or planning restrictions. Extra costs and time delays will be incurred whilst schemes are re-designed to make allowances for these barriers and so forward planning is vital to avoid these. Project managers need to assess the length of time and establish the correct protocols needed to overcome these barriers and build this into their project plans.

Many of these problems appear to have affected projects because project planners were required to design and cost schemes during the bidding stage. Assessing the viability of a design involves a considerable investment of time and resources, and planners can be reluctant to devote substantial resources to a scheme that may never be granted funds. Project planners therefore have to consider carefully how much of this work should be done at the bidding stage and off-set this against the likely costs of not doing so until after funds are secured. In addition, practical aspects of the design of the system may be overlooked which can then result in additional and unforeseen costs once their impacts become apparent. Early findings indicate that attention should be paid to:

- The transportation of cameras for mobile or redeployable schemes. If special vehicles, such as hydraulic platforms, are needed to fix cameras these costs must all be budgeted for. If pool vehicles are to be used for transportation then project managers must be aware that this will have implications for rapid deployment of cameras in response to problems as the appropriate vehicle may not be available when it is needed. This may severely undermine the effectiveness of the project.

- Camera maintenance. Cameras placed high up on buildings are more expensive to maintain because they require specialist equipment for maintenance. Again these extra costs need to be considered at the planning stage.
- Camera installation. The utilisation of existing infrastructure (such as lighting columns) rather than dedicated CCTV poles may provide initial capital savings but such cameras suffer from camera shake. This failure to assess existing non-dedicated poles or infrastructure for 'fitness for purpose' can result in extra costs and delays.
- Camera visibility. The image of cameras can be obscured by rain on the lens. This is a particular problem on fixed cameras where there is no telemetry to enable the condition of the camera to be controlled from a distance. Tree foliage requires ongoing trimming and this needs to be incorporated into the relevant contracts and again costs budgeted for. Street furniture can also obscure camera vision as can temporary installations such as Christmas lights and decorations.

Technologies

For bids under the CCTV Initiative, project planners were required to obtain an approximate quotation for capital costs prior to submitting their bid. These were to be renegotiated at the point of tender. Managers must balance the desire to implement the most effective scheme against the need to remain within a budget set during the bidding stage and as CCTV technology continues to improve and develop their decisions become increasingly hard. Two decisions in particular have been found to have important implications for project implementation:

- What signal transfer method to use.
- Whether to install digital equipment.

Signal transfer method

The choice of signal transfer method is central to the effectiveness of a CCTV scheme, as it will determine the quality of images received in the control room. There is a wide range of signal transfer methods. The schemes examined have tended to use two types, fibre optic and/or microwave.

- The fibre optic method of transferring both analogue and digital signals has several advantages. The information is carried by light through a fibre rendering it immune to electrical noise, as light signals are unaffected by electromagnetic radiation, high frequency radio signals or interference from high voltage conductors. This means that signal attenuation is kept to a minimum, and high quality images are maintained over longer distances. It cannot be tapped easily. Finally, it can deal with large amounts of two-directional data which is useful for large CCTV schemes.
- The microwave method transfers signals through the air. This is suitable for short distances but signal quality is lost as the transfer distance increases to more than 20km, and the signal is susceptible to interference. There must be a direct line of sight between the transmitter and receiver, which can be problematic. Furthermore, the cost of equipment and licensing increases with distance, depending on the signal frequency (Laws 2002). Licences are cheaper and more easily obtainable for cameras operating on frequencies of 31 GHz and 60GHz. However, the camera distances are limited to 10km and 1 km respectively and there is a limit of 19 cameras at 31 GHz. Distances increase to 20 km for cameras operating at 22 and 28 GHz and a greater number of cameras can be added; however, licences are less easy to obtain. Picture quality is also more easily compromised by heavy rain (which absorbs the power) and mounting instability (which desynchronises the signal). It is also possible to intercept a signal unless some form of encryption is used, which has implications under the Data Protection Act 1998. However, as there are no cables to buy and lay, in some situations microwave technology is a cheaper alternative to fibre optics.

Mobile and redeployable schemes are restricted in their choice of transfer method. The fibre optic method is impractical and expensive. For such schemes solutions include:

- The use of microwave transmission for fully or part-mobile schemes, with the proviso that the distance between transmitter and receiver is limited, and there must be a line of sight between the two.

- The mobile phone network (GSM, LAN) has no distance restrictions and the signal is relatively immune to interference. However, data transfer using this method is slow, dependent on network availability, and of little use for active, remote monitoring. This situation may change in the future.
- Radio frequency can be used for distances of up to 4 km. This operates on two frequencies, 1394 MHz and 2.4 GHz. Licences are required for neither of these; therefore similar cameras positioned between the base station and the camera concerned will interfere with the signal. Line of sight is necessary. Furthermore, this method transfers a signal in one direction only; therefore a separate transmission is necessary to control PTZ cameras which require signals to be transferred in two directions (telemetry signals from control room to camera, and image from camera to control room).

Digital vs. analogue recording technology

Analogue recordings are kept on VHS or, more commonly, S-VHS tapes. To maintain the highest quality, tapes should not be over-used. Best-practice control rooms de-gauss tapes between recordings, and re-record up to a maximum of 12 times on any single tape. Tapes are often kept for 31 days prior to re-recording. For a control room monitoring a large number of cameras, rotation and storage of tapes can be a laborious process. However, data storage capacity remains high in comparison with digital recording systems (see below). Digital recordings are generally kept on hard disks. This offers fast and efficient searching methods of retained footage. No degradation of images occurs when copies are made. However, there are still a number of disadvantages with digital recording:

- Storage capacity. Even with the latest advances in compression methods, digital footage requires considerable storage space. Currently a 40 Gb hard disk (a standard PC) holds only about eleven hours of real-time footage. For the sake of comparison, a three hour VHS tape holds the equivalent of 10.8 Gbs of data, as opposed to a DVD which holds 4.7 Gbs.
- Cost. Capital costs can be greater. For smaller systems, the initial outlay of equipment can cost up to 50 per cent more than the equivalent analogue system. This can be increased for larger systems where a greater outlay must be made for storage capacity (Laws 2003). However, this is off-set by the savings in tape handling time and the cost of tapes.

- Presenting footage in different parts of the criminal justice process. For example, at present, the courts are unfamiliar with digital technology and do not have the facilities for its presentation (see PSDB guidance on interim measures: www.crimereduction.gov.uk).

It is possible to use a different archiving method by recording CCTV footage onto DAT, DVD or CD-Rom. It is anticipated that this will combine the advantages of the traditional analogue tape storage system with capacities for rapid search and review and image quality which digital systems possess. It will also remove the need to store large amounts of data on the hard drive. It will not, however, overcome the same difficulties of compatibility with court and police viewing systems. Furthermore, savings in capital costs for storage capacity will be off-set against increased recording media costs and corresponding handling time.

Because digital technology is still fairly new in terms of CCTV use, its full impact has not been assessed properly to date. Furthermore, there are a limited number of companies and consultants who are completely conversant with all its applications and limitations. This poses yet more problems for project planners:

- Project planners are less likely to be able to probe the advice given to them by companies supplying the very latest technology.
- Those who try the latest, most advanced, technology could experience teething problems and will not be able to learn from other's experiences.

Transferable lessons

Physical barriers to implementation

- Unanticipated physical barriers can impede implementation, resulting in re-design or cost overruns. Assessing the viability of a design, and calculating costs accurately requires a significant investment of resources but may save money in the long-run. A thorough survey of the intervention area and ducting routes is recommended, as well as consultation with relevant third parties to discuss such aspects as costs, future works and the time needed for negotiations.
- Project planners must consider how much of this work should be done at the bidding stage. Although early surveying and consultation are recommended, it is recognised that planners may be unwilling to invest significant resources at the bidding stage before funds are guaranteed.
- Project planners should take into account the practical aspects of running the finished scheme. Things to consider that may yield hidden costs include

transportation of cameras in re-locatable schemes, camera maintenance and camera visibility.

Alternative technologies

- The speed of technological advances in CCTV should be kept in mind. This is likely to result in a change in available technology between the time of submitting a bid and drawing up invitations to tender.
- The choice of signal transfer method is central to the effectiveness of the scheme as it will determine the quality of images received in the control room. Careful thought should be given to the objectives and aims of the scheme and appropriateness of different technologies for achieving them.
- For static schemes, fibre optic transmission provides the most effective solution for signal transfer over long distances.
- Project managers wishing to keep costs down should consider microwave transmission bearing in mind that it is only suitable for short distances. Also licensing costs must be taken into account, there must be a direct line of sight between transmitter and receiver and it is susceptible to interference.
- Transfer of footage via the mobile phone network is possible and especially suited to mobile schemes. However, data transfer is very slow and of limited use for active monitoring purposes. This is likely to change with the advent of new mobile telephone technology (Laws 2002).
- Digital technology is becoming more prevalent in CCTV schemes and digital recording offers fast and efficient searching methods. However, there remain a number of problems, including storage and the unfamiliarity of courts with digital footage and their lack of equipment to handle such digital media. There is currently no guarantee of compatibility between different manufacturers' equipment.
- Digital technology is at the forefront of the CCTV industry, so there are relatively few companies available to supply and advise on equipment. Disadvantages of this situation include:
 - ❑ Project planners are unlikely to be able to query advice given by suppliers of the latest digital technology.
 - ❑ There can be a monopoly of supply on the most advanced equipment.
- Projects risk becoming "guinea pigs" for the latest innovations.

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